
From: Travis, Rashmi (DHHS)
Sent: Tuesday, October 06, 2015 12:46 PM
To: Wells, Eden (DHHS);Eisner, Jennifer (DHHS)
Cc: Peeler, Nancy (DHHS);Miller, Amy J. (DHHS);Lishinski, Karen (DHHS);Minicuci, Angela (DHHS)
Subject: RE: Drinking Water

Rashmi's comments:

I can't remember if we have another document on this, but since this is going out to parents, do we want to include a few lines on what happens when you have a high lead level? I know we have specific brochures on eating the right foods, etc. Also, do we want to include a line that indicates these lead sources may be in your home or caregivers homes where your child visits or is cared for? Just a thought.... since some of the children spend many hours away from their home base.

-----Original Message-----

From: Wells, Eden (DHHS)
Sent: Tuesday, October 06, 2015 12:43 PM
To: Eisner, Jennifer (DHHS)
Cc: Peeler, Nancy (DHHS); Miller, Amy J. (DHHS); Lishinski, Karen (DHHS); Travis, Rashmi (DHHS); Minicuci, Angela (DHHS)
Subject: Re: Drinking Water

see Rashmi's as well-

From: Eisner, Jennifer (DHHS)
Sent: Tuesday, October 6, 2015 12:38 PM
To: Wells, Eden (DHHS)
Cc: Peeler, Nancy (DHHS); Miller, Amy J. (DHHS); Lishinski, Karen (DHHS); Travis, Rashmi (DHHS); Minicuci, Angela (DHHS)
Subject: Re: Drinking Water

Looks good to me with Eden's edits. Working from my phone so looping in Angela to review as well

Sent from my iPhone

> On Oct 6, 2015, at 12:08 PM, "Wells, Eden (DHHS)" <WellsE3@michigan.gov> wrote:

>
>
> Jen, what do you think of attached? My edits below--Amy may weigh in and ?? Rashmi.
>

> From: Wells, Eden (DHHS)
> Sent: Tuesday, October 6, 2015 12:04 PM
> To: Peeler, Nancy (DHHS); Miller, Amy J. (DHHS)
> Cc: Lishinski, Karen (DHHS); Travis, Rashmi (DHHS)
> Subject: Re: Drinking Water
>

> Broke my own chain of command! I would use "drinking water if supplied by lead pipes"---similar to the slides I used for the Physicians webinar- not all water would have lead ,necessarily!

>
> Also, the contacting local water authority needs its own bullet.
>
> Due to time issues am looping in Jennifer, as she is getting questions about this from media....sound OK, folks?
>
>
>
>

> From: Peeler, Nancy (DHHS)
> Sent: Tuesday, October 6, 2015 11:40 AM
> To: Miller, Amy J. (DHHS); Wells, Eden (DHHS)
> Cc: Lishinski, Karen (DHHS)
> Subject: RE: Drinking Water
>
> Sending next version of the Parent Handout. Changes to date:
> 1. page 1, causes of lead poisoning, added sentence about other sources of lead, which mentions water.
> 2. page 2, what can I do to protect my child, added sentence about contacting local water authority to have water tested.
>
> Amy and Eden, if you can review, let us know if this address your request to add information pertaining to water. If yes, please let us know if it is approved, and we'll work with Jeff Ellsworth to get this up on our website today. If no, we'll take another crack at it.
>
> Nancy
>
> -----Original Message-----
> From: Peeler, Nancy (DHHS)
> Sent: Monday, October 05, 2015 4:28 PM
> To: Miller, Amy J. (DHHS); Wells, Eden (DHHS)
> Cc: Lishinski, Karen (DCH) (LishinskiK@michigan.gov)
> Subject: FW: Drinking Water
> Importance: High
>
> Hi Amy and Eden, per Amy's request to edit our Parent Handout on our website.
>
> We made an edit, on page 2, under "What can I do to protect my child from lead?" We added to the 3rd bullet, "Consider contacting your local water authority to have your water tested." (see attached)
>
> Re-reading your email, were you also wanting us to add something about water to page 1, in the section about "What causes lead poisoning?" If yes, we could try to add text something like we have in the info sheet for Pregnant and Nursing Mothers and Lead (attached), where it references "Other sources of exposure may include soil and water..."
>
> If that is more of what you are looking for, we can get that done either tonight or first thing in the morning. And/or if you have a specific sentence or phrase you'd like us to add, send it along!
>
> Nancy
>
>
>
>
>
>

>
> -----Original Message-----
> From: Lounds, Elizabeth (DHHS)
> Sent: Monday, October 05, 2015 1:04 PM
> To: Peeler, Nancy (DHHS); Emily
> Cc: Lishinski, Karen (DHHS)
> Subject: FW: Drinking Water
> Importance: High
>
> I know Karen's out - but I wanted her to be included. Please see Amy's email below. I have already replied to Amy that I would be forwarding to you for review and edits. :) Beth
>
> -----Original Message-----
> From: Miller, Amy J. (DHHS)
> Sent: Monday, October 05, 2015 1:00 PM
> To: Lounds, Elizabeth (DHHS)
> Subject: Drinking Water
> Importance: High
>
> Hi Elizabeth -
>
> This document: http://michigan.gov/documents/lead/Parent_Handout_Sept2015_501802_7.pdf is one that we recently approved.
>
> We should make sure it reflects that lead poisoning can happen from the water so that people should get the water in their home tested as well.
>
> Can you please update this piece and send the rewording to us? Geralyn and Angela both mentioned that Dr. Wells would be a great resources for help with the language.
>
> Thank you,
>
> Amy
> <Parent Handout Is Your Child Safe From Lead PoisoningRV3.pdf>

From: Garcia, Deborah (DHHS)
Sent: Thursday, December 17, 2015 4:54 PM
To: Lyon, Nick (DHHS)
Cc: Grijalva, Nancy (DHHS);Rick, Matthew (DHHS);Waggoner, Carrie (DHHS)
Subject: FOIA 2015-557 Marc Edwards-Flint Water Responsive Documents
Attachments: FOIA 2015-557 RedactedResponsiveDocs.zip; Flint Testing and EBLLs_updated 092315 _with notes NORedactions.pdf; Pediatric Lead Exposure Flint Water.from Hurley NORedactions.pdf; Notes from Mark Miller-no date NORedactions.pdf

Importance: High

Nick,

Per your request. Please see the attached responsive documents Part 1.

Debbie

Deborah R. Garcia, JD, MAHS
Public Health Administrative Law Specialist
Michigan Department of Health and Human Services
Office of Legal Affairs
Capitol View Building, 7th Fl.
201 Townsend Street
Lansing, MI 48913
Direct Line: 517-241-3374
Fax: 517-241-1200
Garcia.d2@michigan.gov

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This Document is a Non-Responsive Attachment.

From: Valacak, Mark <MVALACAK@gchd.us>
Sent: Monday, September 28, 2015 1:57 PM
To: Miller, Mark (DHHS); Travis, Rashmi (DHHS)
Subject: RE: State lead testing results???

Mark & Rashmi,

I want to know whether you have confirmed with the lead program staff at MDHHS that the state results that purport that lead levels have not shown a significant increase since the changeover of the water supply for the city of Flint indeed represent Flint city zip codes only and not Flint mailing addresses. As I mentioned to you both this morning, Flint mailing addresses would include outlying areas like Flint and Mundy Townships which obtain their water from the Detroit Water Authority.

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us



Public Health

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"There are two lasting bequests we can hope to give our children: one is roots; the other is wings." Hodding Carter

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From: Miller, Mark (DCH) [<mailto:millerm1@michigan.gov>]
Sent: Monday, September 28, 2015 11:28 AM
To: Valacak, Mark
Subject: testing

So they're wondering about testing capacity up here.

If the City of Flint gets a big deluge of requests, will they be able to handle them? Would they need additional assistance? Have they projected any expected demand? They are currently testing right?

Thanks!

Mark Miller
Director, Local Health Services
Michigan Department of Health & Human Services
201 Townsend, 6th Floor
Lansing MI 48913
(517) 335-8032
millerm1@michigan.gov

From: Miller, Mark (DHHS)
Sent: Tuesday, September 29, 2015 9:44 AM
To: Valacak, Mark
Cc: Dykema, Linda D. (DHHS); LyonCallo, Sarah (DHHS); Travis, Rashmi (DHHS)
Subject: FW: State lead testing results???

Mark, I have a call with Epi staff today at 4 PM. So I'll get an update at that time. I've also cc:ed Linda Dykema and Sara Lyon-Calio, who might be able to respond sooner with a timeline.

Mark

From: Valacak, Mark [mailto:MVALACAK@gchd.us]
Sent: Tuesday, September 29, 2015 9:23 AM
To: Miller, Mark (DCH) ; Travis, Rashmi (DCH)
Subject: RE: State lead testing results???

Any results yet? If not can you give me a timeline when you will have results?

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
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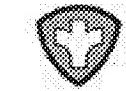
From: Valacak, Mark
Sent: Monday, September 28, 2015 1:57 PM
To: 'Miller, Mark (DCH)'; 'TravisR@michigan.gov'
Subject: RE: State lead testing results???

Mark & Rashmi,

I want to know whether you have confirmed with the lead program staff at MDHHS that the state results that purport that lead levels have not shown a significant increase since the changeover of the water supply for the city of Flint indeed represent Flint city zip codes only and not Flint mailing addresses. As I mentioned to you both this morning, Flint

mailing addresses would include outlying areas like Flint and Mundy Townships which obtain their water from the Detroit Water Authority.

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From: Peeler, Nancy (DHHS)
Sent: Tuesday, September 29, 2015 4:39 PM
To: Lasher, Geralyn (DHHS); Wells, Eden (DHHS); Miller, Corinne (DHHS); Moran, Susan (DHHS); Robinson, Mikelle (DHHS); Dykema, Linda D. (DHHS); LyonCallo, Sarah (DHHS); Hertel, Elizabeth (DHHS); Travis, Rashmi (DHHS); Miller, Mark (DHHS)
Cc: Minicuci, Angela (DHHS); Eisner, Jennifer (DHHS); Grijalva, Nancy (DHHS)
Subject: RE: Public Health Advisory

Curious whether they issued the same thing to Hurley, as their analysis sample (based on zip codes 48501-48507) also appears to extend beyond the city geographic boundaries, into Townships that are on Detroit water?

From: Lasher, Geralyn (DCH)
Sent: Tuesday, September 29, 2015 12:06 PM
To: Wells, Eden (DCH); Miller, Corinne (DCH); Moran, Susan (DCH); Robinson, Mikelle (DCH); Dykema, Linda D. (DCH); LyonCallo, Sarah (DCH); Hertel, Elizabeth (DCH); Peeler, Nancy (DCH); Travis, Rashmi (DCH); Miller, Mark (DCH)
Cc: Minicuci, Angela (DCH); Eisner, Jennifer (DCH); Grijalva, Nancy (DCH)
Subject: FW: Public Health Advisory
Importance: High

And Genesee County and the Genesee County Health Department, have just issued the attached public health advisory and on the final paragraph it says:

Recent data provided by Hurley Hospital researchers has indicated that a significant increase in blood lead levels has occurred in children since the switch to Flint River water. The county Health Officer has requested that the Michigan Department of Health and Human Services (MDHHS) provide to the County specific data to support its claim that state data is more comprehensive and does not show a significant increase. To date, the MDHHS has failed to confirm the geographic area included in their findings. We want to assure the state data is specific to the boundaries of the City of Flint, and not Flint addresses which would include addresses in areas outside of the City of Flint. These areas, such as Flint Township, that obtain their water from the Detroit Water Authority and would, therefore, not be representative of Flint River water as the water source. The County is prepared to take further action if the State fails to provide the requested data by September 30, 2015. Further action could include a request for outside independent evaluation of the data and to declare a Public Health Emergency in Flint.

I understand that we are still reviewing the data---but the county has basically issued a ransom date that they want this information by tomorrow.

Eden---please coordinate an answer so Nick can walk into the 1:00 p.m. meeting prepared on this.

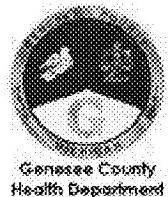
From: Minicuci, Angela (DCH)
Sent: Tuesday, September 29, 2015 11:59 AM
To: Lasher, Geralyn (DCH) <lasherg@michigan.gov>
Subject: FW: Public Health Advisory
Importance: High

Last paragraph, last page.

Angela

From: Sandlin, Mary [mailto:MSANDLIN@gchd.us]
Sent: Tuesday, September 29, 2015 11:55 AM
Subject: Public Health Advisory
Importance: High

Mary E. Sandlin
Clerical Coordinator
Genesee County Health Department
630 S. Saginaw Street, Suite 4
Flint, MI 48502-1540
(810) 257-3812 FAX: (810) 257-3147
msandlin@gchd.us



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From: Valacak, Mark <MVALACAK@gchd.us>
Sent: Tuesday, September 29, 2015 9:23 AM
To: Miller, Mark (DHHS); Travis, Rashmi (DHHS)
Subject: RE: State lead testing results???

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From: Valacak, Mark
Sent: Monday, September 28, 2015 1:57 PM
To: 'Miller, Mark (DCH)'; 'TravisR@michigan.gov'
Subject: RE: State lead testing results???

Mark & Rashmi,

I want to know whether you have confirmed with the lead program staff at MDHHS that the state results that purport that lead levels have not shown a significant increase since the changeover of the water supply for the city of Flint indeed represent Flint city zip codes only and not Flint mailing addresses. As I mentioned to you both this morning, Flint mailing addresses would include outlying areas like Flint and Mundy Townships which obtain their water from the Detroit Water Authority.

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From: Miller, Mark (DCH) [mailto:millerm1@michigan.gov]

Sent: Monday, September 28, 2015 11:28 AM

To: Valacak, Mark

Subject: testing

So they're wondering about testing capacity up here.

If the City of Flint gets a big deluge of requests, will they be able to handle them? Would they need additional assistance? Have they projected any expected demand? They are currently testing right?

Thanks!

Mark Miller
Director, Local Health Services
Michigan Department of Health & Human Services
201 Townsend, 6th Floor
Lansing MI 48913
(517) 335-8032
millerm1@michigan.gov

From: Robinson, Mikelle (DHHS)
Sent: Thursday, October 01, 2015 11:57 AM
To: Travis, Rashmi (DHHS)
Cc: Miller, Mark (DHHS)
Subject: FW: Talking Points
Attachments: Flint Water Talking Points.docx

Importance: High

Rashmi,

Does Nancy P have bullet points explaining the data or is that something from Corinne's shop?

From: Eisner, Jennifer (DHHS)
Sent: Thursday, October 01, 2015 11:52 AM
To: Miller, Corinne (DHHS); Robinson, Mikelle (DHHS)
Cc: Wells, Eden (DHHS)
Subject: Talking Points

Corinne and Mikelle:

Attached please find the most recent Flint talking points which include edits from Dr. Wells. A 12:30 meeting with the gov's comms team was just called, so we need to have them finalized and ready to share asap.

Can you please send me the bullet points explaining the data – or what is ready of them – by noon?

Thank you,

Jennifer (Smith) Eisner
Public Information Officer
Michigan Department of Health and Human Services
517-241-2112

Blood Lead Levels in Flint Talking Points

October 1, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley;
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - there is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 49503 and 49504. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
- We reviewed MDHHS statewide data using the same methodology used by Hurley, looking at our numbers by zip code and age ranges, and filtering out non-Flint children.
- Routine surveillance of blood lead levels does not analyze data down to the zip code level. Detailed analysis like this occurs when there is reason to focus in on precise locations or populations.
- MDHHS will be working closely with the Michigan Department of Environmental Quality, Hurley Children's Hospital, the Genesee County Health Department, and community organizations to initiate further action steps.

- We understand that cost may be a barrier to following the recommendations of the local health department. We are actively working with public and private partners to make resources available to those who may need assistance.
- MDHHS is recommending that residents follow the Public Health Advisory issued by the Genesee County Health Department, as well as take further steps to reduce exposures to all forms of lead in and around their homes.

MDHHS Stats and Facts

- **Data charts/breakdowns and explanations:**

- Lead abatement through MDHHS was federally funded up until FY14 when Michigan began providing additional funds to abate homes.
- In FY14, \$1.25M General Fund was added. In FY15, General Fund was bumped up to \$1.75M and FY16, General Fund remains at \$1.75M.

Comment [EVW1]: Coming today

Reducing and Removing Lead Exposure

- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
- Make sure your child does not have access to peeling paint or chewable surfaces painted with lead-based paint.
- Children and pregnant women should not be present in housing built before 1978 that is undergoing renovation. They should not participate in activities that disturb old paint or in cleaning up paint debris after work is completed.
- Create barriers between living/play areas and lead sources. Until environmental clean-up is completed, you should clean and isolate all sources of lead.
 - Close and lock doors to keep children away from chipping or peeling paint on walls. You can also apply temporary barriers such as contact paper or duct tape, to cover holes in walls or to block children's access to other sources of lead.
- Regularly wash children's hands and toys. Hands and toys can become contaminated from household dust or exterior soil. Both are known lead sources.
- Regularly wet-mop floors and wet-wipe window components. Because household dust is a major source of lead, you should wet-mop floors and wet-wipe horizontal surfaces every 2-3 weeks.
 - Windowsills and wells can contain high levels of leaded dust. They should be kept clean. If feasible, windows should be shut to prevent abrasion of painted surfaces or opened from the top sash.
- Take off shoes when entering the house to prevent bringing lead-contaminated soil in from outside.

- Prevent children from playing in bare soil; if possible, provide them with sandboxes. Plant grass on areas of bare soil or cover the soil with grass seed, mulch, or wood chips, if possible.
 - Until the bare soil is covered, move play areas away from bare soil and away from the sides of the house. If you have a sandbox, cover the box when not in use to prevent cats from using it as a litter box. That will help protect children from exposure to animal waste.
- Avoid using makeup, containers, cookware, or tableware to store or cook foods or liquids that are not shown to be lead free.
- Remove recalled toys and toy jewelry immediately from children.
- Use only cold water from the tap for drinking, cooking, and making baby formula. Hot water is more likely to contain higher levels of lead. Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.
- Shower and change clothes after finishing a task that involves working with lead-based products such as stained glass, making bullets, or using a firing range.

WIC Children

- There are 855 infants participating in WIC in Flint
- In homes with infants on WIC, if the household has documentation from an official source of unsanitary water supply issues, that family may be eligible to receive ready-to-feed formula. Families should contact WIC to see if they are eligible.
- Each household would have to be looked at on an individual basis.
- WIC cannot cover bottled water.

Background

- The results of the Hurley Children's Hospital were reviewed by MDHHS after the study was released last week.
- The analysis that Hurley conducted was different from the initial MDHHS data regarding blood lead levels in Flint.
- MDHHS initial data looked at the entire blood lead levels for the Flint area for the past five years and showed the annual seasonal trends in the area.
- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. Further, seasonal variations in water can occur due to changes in temperature, pH , and other factors

From: Peeler, Nancy (DHHS)
Sent: Wednesday, September 30, 2015 6:50 PM
To: Wells, Eden (DHHS); Miller, Corinne (DHHS); Miller, Mark (DHHS); LyonCallo, Sarah (DHHS); Dykema, Linda D. (DHHS); Priem, Wesley F. (DHHS); Travis, Rashmi (DHHS)
Cc: Fink, Brenda (DHHS); Scott, Robert L. (DHHS)
Subject: RE: Hurley -- follow up about the question on Hurley lab results

I can partially answer your question now, will get additional info from Bob and send more later.

The data flows in daily, year-round. We process several thousand test results every week. We monitor the results daily, and have an algorithm for our follow-up response, based on the blood lead level.

Because we are processing results every day, we do see some patterns if they begin to emerge, especially with the higher lead levels. We normally track and report data at health department level, county level/Detroit. We are still building our capacity and putting new procedures in place via our CDC Surveillance grant to crank out more reports/report cards, and more frequent data reports, especially with the switch in focus to levels of 5 and above (which means we are focusing on a larger number of results than just 10 and above). We develop and share out many maps, charts, graphs, and yes, do publish an annual legislative report.

We have .2 FTE Epi support (Cristin Larder), mostly for special projects and/or reports, for example, Cristin is working with us and Dr. Stan Kaplowitz from MSU to use his research to help pinpoint smaller geographic areas with higher risk, so we can better direct resources toward those areas.

Bob, can you please add more information about frequency of your analysis, and how we detect issues?

From: Wells, Eden (DCH)
Sent: Wednesday, September 30, 2015 6:24 PM
To: Peeler, Nancy (DCH); Miller, Corinne (DCH); Miller, Mark (DCH); LyonCallo, Sarah (DCH); Dykema, Linda D. (DCH); Priem, Wesley F. (DCH); Travis, Rashmi (DCH)
Subject: RE: Hurley -- follow up about the question on Hurley lab results

That sounds about right.

May I ask,, is it CLPP's usual process to collect the lead data on an ongoing basis...if so, at what level is the data usually analyzed (by Epi?) IS it daily,nmonthly? Quarterly? Annually? How would we normally detect/know if there is an issue in a particular locality---do you look at it at county level or smaller when you peruse your data? This question may arise...

E

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 30, 2015 5:22 PM
To: Miller, Corinne (DCH); Miller, Mark (DCH); LyonCallo, Sarah (DCH); Dykema, Linda D. (DCH); Priem, Wesley F.

(DCH); Travis, Rashmi (DCH); Wells, Eden (DCH)

Subject: FW: Hurley -- follow up about the question on Hurley lab results

Hi all – I talked to Bob to confirm the information I had shared about the Hurley lab results. It is a little more nuanced than I had explained, forwarding Bob's explanation, FYI.

From: Scott, Robert L. (DCH)

Sent: Wednesday, September 30, 2015 5:05 PM

To: Peeler, Nancy (DCH)

Subject: Hurley

Hurley Medical Center is listed as the “Provider” on approximately half of the blood lead results we received for Flint children in 2014—I assume that pattern holds in 2015 and in recent years. Warde Medical Lab is listed as the “Laboratory” on those results. Warde reported the results to CLPPP in accordance with State law.

I can't say whether the blood specimens were a) drawn at Hurley's lab, or b) simply passed through Hurley's lab—from physician office to Hurley to Warde for analysis. As I understand it, both scenarios are common at various hospital labs.

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Hertel, Elizabeth (DHHS)
Sent: Thursday, October 01, 2015 12:04 PM
To: Miller, Mark (DHHS); Minicuci, Angela (DHHS)
Cc: Robinson, Mikelle (DHHS); Travis, Rashmi (DHHS); Moran, Susan (DHHS); Thompson, Sheryl D. (DHHS)
Subject: RE: State lead testing results???

Just FYI, Mark contacted Sheryl Thompson in field services about the United Way donation. Can we get the info regarding how many WIC recipients receive other services expedited, please?

From: Miller, Mark (DHHS)
Sent: Thursday, October 01, 2015 12:02 PM
To: Minicuci, Angela (DHHS); Hertel, Elizabeth (DHHS)
Cc: Robinson, Mikelle (DHHS); Travis, Rashmi (DHHS); Moran, Susan (DHHS)
Subject: FW: State lead testing results???

Angela and Elizabeth, below is what I sent to Mark Valacak, the health officer at the GCHD, yesterday.

Given our delayed timeline, I'll resend the message and tell him the analysis won't be available until 10 on Friday the 2nd.

Either Rashmi or I will inquire about the requested WIC data, as well as what he knows about distribution of filters in the City.

From: Miller, Mark (DCH)
Sent: Wednesday, September 30, 2015 2:22 PM
To: 'Valacak, Mark' <MVALACAK@gchd.us>
Subject: RE: State lead testing results???

Mark

They should have their analysis complete by mid-morning on Thursday (1st) and will contact you by phone regarding same.

Thanks

Mark

From: Valacak, Mark [mailto:MVALACAK@gchd.us]
Sent: Wednesday, September 30, 2015 9:22 AM
To: Miller, Mark (DCH) <millerml@michigan.gov>
Subject: RE: State lead testing results???

So, any update?

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us



Public Health

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"There are two lasting bequests we can hope to give our children: one is roots; the other is wings." Hodding Carter

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From: Miller, Mark (DCH) [mailto:millerml@michigan.gov]
Sent: Tuesday, September 29, 2015 9:44 AM
To: Valacak, Mark
Cc: Dykema, Linda D. (DCH); LyonCallo, Sarah (DCH); Travis, Rashmi (DCH)
Subject: FW: State lead testing results???

Mark, I have a call with Epi staff today at 4 PM. So I'll get an update at that time. I've also cc:ed Linda Dykema and Sara Lyon-Callop, who might be able to respond sooner with a timeline.

Mark

From: Valacak, Mark [mailto:MVALACAK@gchd.us]
Sent: Tuesday, September 29, 2015 9:23 AM
To: Miller, Mark (DCH) <millerml@michigan.gov>; Travis, Rashmi (DCH) <TravisR@michigan.gov>
Subject: RE: State lead testing results???

Any results yet? If not can you give me a timeline when you will have results?

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us



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From: Valacak, Mark
Sent: Monday, September 28, 2015 1:57 PM
To: 'Miller, Mark (DCH)'; 'TravisR@michigan.gov'
Subject: RE: State lead testing results???

Mark & Rashni,

I want to know whether you have confirmed with the lead program staff at MDHHS that the state results that purport that lead levels have not shown a significant increase since the changeover of the water supply for the city of Flint indeed represent Flint city zip codes only and not Flint mailing addresses. As I mentioned to you both this morning, Flint mailing addresses would include outlying areas like Flint and Mundy Townships which obtain their water from the Detroit Water Authority.

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us



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From: LyonCallo, Sarah (DHHS)
Sent: Friday, September 25, 2015 2:42 PM
To: Dykema, Linda D. (DHHS)
Cc: Miller, Mark (DHHS); Priem, Wesley F. (DHHS)
Subject: Re: Childhood Lead Poisoning Prevention program documents

Yes. We can look at younger as well.

Sent from my iPad

On Sep 25, 2015, at 2:01 PM, Dykema, Linda D. (DCH) <Dykernal@michigan.gov> wrote:

It would appear that the Hurley physicians are looking at just younger children, rather than 0-16 years as did CLPPP.

From: Miller, Mark (DCH)
Sent: Friday, September 25, 2015 1:55 PM
To: Dykema, Linda D. (DCH); Priem, Wesley F. (DCH)
Subject: FW: Childhood Lead Poisoning Prevention program documents
Importance: High
FYI. Don't distribute too broadly!

From: Travis, Rashmi (DCH)
Sent: Friday, September 25, 2015 11:15 AM
To: Miller, Mark (DCH) <millerm1@michigan.gov>
Subject: FW: Childhood Lead Poisoning Prevention program documents
Importance: High
FYI the PPT from Hurley.

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 23, 2015 5:33 PM
To: Travis, Rashmi (DCH); Robinson, Mikelle (DCH); Lasher, Geralyn (DCH); Hertel, Elizabeth (DCH)
Cc: Fink, Brenda (DCH)
Subject: Childhood Lead Poisoning Prevention program documents
Importance: High

Hello – I'm going to send a series of emails with materials you have asked for, as a way to organize them. The first document attached to this email is our CLPPP updated analysis of the blood lead testing data we have for children aged 0-16 in Flint. This is an update from what we sent to the Director's office earlier in the year, in that we added an additional year (2010-2011), and added data for May-August 2015 (per Geralyn's request in an email late last week).

Regarding this data:

- We are using the timeframe of May –April for this chart, because the water source change in Flint happened in April 2014. So, we started by looking at the 12 month time period from May 2014 – April 2015. Then we went back and compared that same time frame to the 4 previous years, to see if the pattern was similar, significantly different, etc.
- We included all children with a Flint address, which may not exactly conform to the city boundaries.
- We only included first time blood lead levels of ≥ 5 mcg/dL, not all subsequent tests a child may have received.

- We included all types of blood samples – venous blood draws, capillary samples, or unknown (e.g. not labeled as venous or capillary). Typically we would point to venous samples as the best, most reliable, but we had many non-venous samples, so to be inclusive added those in.

Looking at the charts, you can definitely see the seasonal impact associated with lead poisoning.

We do NOT see a different pattern of results for the 2014-2015 year, right after the change in water source. That year looks more like the data from 10-11, and 11-12.

For the full 5 years worth of data, testing rates were pretty consistent, so we don't think that is driving the data. However, note that testing levels for May-August 2015 appear to be lower than in the previous 5 years.

The second document I have attached is a presentation sent to us this morning by Dr. Mona Hanna-Attisha, from Hurley Medical Center. She shared this related to her data request that she sent to our program. In scanning it, we noted that she is using different data than we did (by age, by zip code, time frames, which years she included, etc.), so comparing our data chart to her results is like comparing apples and oranges. We have not run any analyses using her parameters. We did note some slides in her document that we might disagree with, for example her statement that water is the primary source of lead (in Michigan, it remains lead paint that is our primary source of lead exposure).

Please let us know if you have questions you have about the data charts we produced. Next email will be some of our program materials, that may be of use in the upcoming outreach effort. Also, Rashmi indicated who I should include on this email, and I trust you will share with others as appropriate.

Nancy

Message

From: Robinson, Mikelle (DHHS) [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=423A27AB9E1B4759A388CA40C97ADED2-ROBINSON MIKELLE D]
Sent: 9/24/2015 6:26:44 PM
To: Minicuci, Angela (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=2d0ac400bb204b31972a0c99f7981923-Minicuci Angela]
CC: Peeler, Nancy (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=ec5ddcb9dcec411293aaaf42aef28bd-Peeler Nancy]; Scott, Robert L. (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1aefbcada9a48ad8d643aa95e441df1-Scott Robert L.]; Lasher, Geralyn (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=7c6348a76f064a3b972bccb3598de4d-Geralyn Lasher]; Eisner, Jennifer (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=e58a0110d9914d1395311d742e28b4c9-Smith Jenni]; Hertel, Elizabeth (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=50e689d690b541ec81785428adb65ff4-Hertel Elizabeth]; Moran, Susan (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=187c9ca7fca94c14a6f60427230837a4-Moran Susan]; Miller, Mark (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=1a5bad5ac8ef4c53a24e5c4cb91853ff-Miller Mark_809e010b9b]
Subject: RE: Flint lead data

Mark Valacak (health officer) informed me that he sent some recommended revisions to the city water department for the advisory and will forward it to me when it is available. So, I assume an advisory is still being planned.

From: Minicuci, Angela (DCH)
Sent: Thursday, September 24, 2015 2:07 PM
To: Peeler, Nancy (DCH); Scott, Robert L. (DCH); Lasher, Geralyn (DCH); Eisner, Jennifer (DCH); Robinson, Mikelle (DCH); Moran, Susan (DCH); Hertel, Elizabeth (DCH)
Subject: FW: Flint lead data

The Next Steps slide no longer recommends that the city declare a health advisory. It now says 'support city's health advisory'. If Flint will be issuing a health advisory, will Genesee County support this?

Angela

From: Murray, David (GOV)
Sent: Thursday, September 24, 2015 1:56 PM

To: Hollins, Harvey (GOV) <hollinsh@michigan.gov>; Lasher, Geralyn (DCH) <lasherg@michigan.gov>; Minicuci, Angela (DCH) <MinicuciA@michigan.gov>; Eisner, Jennifer (DCH) <EisnerJ@michigan.gov>; Clement, Elizabeth (GOV) <clemente@michigan.gov>; Muchmore, Dennis (GOV) <muchmored@michigan.gov>; Agen, Jarrod (GOV) <AgenJ@michigan.gov>; Wurfel, Sara (GOV) <Wurfels@michigan.gov>; Wurfel, Brad (DEQ) <WurfelB@michigan.gov>; Tommasulo, Karen (DEQ) <Tommasulok@michigan.gov>
Cc: Biehl, Laura (GOV) <BiehlL@michigan.gov>; Brown, Jessica (GOV) <BrownJ53@michigan.gov>; Heaton, Anna (GOV) <HeatonA@michigan.gov>
Subject: Flint lead data

Team,

Here's the data that will be presented at the Hurley Hospital press conference at 3 p.m. As you'll see, they are pointing to individual children, a very emotional approach. Our challenge will be to show how our state data is different from what the hospital and the coalition members are presenting today.

Dave

----- Forwarded message -----

From: Andy Leavitt <aleavitt@senatedems.org>
Date: Thu, Sep 24, 2015 at 1:41 PM
Subject: Data
To: Angela Wittrock <awitrock@senatedems.org>

Hey Angela,

Sorry for the delay. Dr. Mona Hanna-Attisha wanted to make a few changes to one of her slides.

Andy

From: LyonCallo, Sarah (DHHS)
Sent: Friday, September 25, 2015 6:02 PM
To: Miller, Corinne (DHHS)
Cc: Dykema, Linda D. (DHHS); Priem, Wesley F. (DHHS); Groetsch, Kory J. (DHHS); Peeler, Nancy (DHHS); Miller, Mark (DHHS); McFadden, Jevon (DHHS)
Subject: RE: embedded powerpoint

Whoops! Sorry Corinne!!

From: Miller, Corinne (DCH)
Sent: Friday, September 25, 2015 2:49 PM
To: LyonCallo, Sarah (DCH)
Cc: Dykema, Linda D. (DCH); Priem, Wesley F. (DCH); Groetsch, Kory J. (DCH); Peeler, Nancy (DCH); Miller, Mark (DCH); McFadden, Jevon (DCH)
Subject: Re: embedded powerpoint

State epi makes the request for an epi-aid.

Sent from my iPhone

On Sep 25, 2015, at 1:43 PM, LyonCallo, Sarah (DCH) <lyoncallos@michigan.gov> wrote:

Is that process like an epi-aid? where the state health officer makes the request?

Sent from my iPad

On Sep 25, 2015, at 2:21 PM, Dykema, Linda D. (DCH) <Dykemal@michigan.gov> wrote:

I just spoke with Mark Johnson with the ATSDR R5 office in Chicago. As you're probably aware, Sen. Kildee has contacted EPA, CDC, DEQ about lead in Flint drinking water, which is how ATSDR has become involved. Mark suggested MDHHS request an independent CDC review of the EBL data to address the issues raised by the Hurley study.

From: Miller, Corinne (DCH)
Sent: Thursday, September 24, 2015 4:57 PM
To: Priem, Wesley F. (DCH); Dykema, Linda D. (DCH); Groetsch, Kory J. (DCH)
Subject: embedded powerpoint

This link should take you to an embedded PowerPoint of a Hurley physician study on lead in the Flint drinking water.

http://www.mlive.com/opinion/flint/index.ssf/2015/09/abandon_flint_river_for_drinki.html

Corinne

From: Grijalva, Nancy (DHHS)
Sent: Monday, September 28, 2015 11:12 AM
To: Miller, Mark (DHHS)
Subject: RE: Proposed Press Conference and situation report from Mark Valacak, health officer

What exactly do you mean Gearing up to do more water testing? How much more? When will they start?

From: Miller, Mark (DCH)
Sent: Monday, September 28, 2015 10:52 AM
To: Anderson, Paula (DCH); Moran, Susan (DCH); Hertel, Elizabeth (DCH); Dykema, Linda D. (DCH); Miller, Corinne (DCH); Wells, Eden (DCH); Becker, Timothy (DCH); Lasher, Geralyn (DCH); Grijalva, Nancy (DCH)
Cc: Robinson, Mikelle (DCH)
Subject: RE: Proposed Press Conference and situation report from Mark Valacak, health officer

ALL:

Rashmi and I had a conference call this morning with Mark Valacak, the health officer at the Genesee County Health Department. He should be invited to the proposed press conference (below) and consulted with in advance. He's at 810 257-3588 or mvalacak@gchd.us.

From Mark Valacak:

On Formula and WIC

If a client calls and has concerns about their water, the GCHD will advise them to get their water tested by the City of Flint. If the results come back with elevated lead levels, they can be eligible to switch from powdered formula to "ready to feed". Meanwhile, they will advise the resident to run the cold water tap for at least 5 minutes, and if they want to be absolutely sure, they should use bottled water for all drinking, cooking and making formula until the tests come back. Bottled water is available from the "Diaper Bank" in Flint. (WIC staff are checking to see how much premade formula is available statewide.)

Testing

City of Flint is gearing up to do more water testing for residents.

Data

Mark Valacak said there's some question about our lead testing database, as there are FLINT mailing addresses in both Mundy and Flint Townships, and those Townships are still on *City of Detroit Water*. (Data questions are being followed up on with Epi Staff.)

Other PR

The Flint School Systems advised all students to bring bottled water to school.

There is a Flint City Council meeting on Monday, Sept. 28th, at 9 PM. They expect the water situation to be discussed.

Mark Miller
Director, Local Health Services
Michigan Department of Health & Human Services
201 Townsend, 6th Floor
Lansing MI 48913
(517) 335-8032
millerm1@michigan.gov

From: Anderson, Paula (DCH)
Sent: Monday, September 28, 2015 10:19 AM
To: Miller, Mark (DCH) <millerm1@michigan.gov>; Travis, Rashmi (DCH) <TravisR@michigan.gov>
Subject: FW: Proposed Press Conference on Flint Drinking Water

fyi

From: Grijalva, Nancy (DCH)
Sent: Monday, September 28, 2015 10:16 AM
To: Moran, Susan (DCH); Lyon, Nick (DCH)
Cc: Robinson, Mikelle (DCH); Wells, Eden (ewells@umich.edu); Hertel, Elizabeth (DCH); Lasher, Geralyn (DCH); Becker, Timothy (DCH); Dykema, Linda D. (DCH); Miller, Corinne (DCH); Anderson, Paula (DCH)
Subject: RE: Proposed Press Conference on Flint Drinking Water

Nick now has a phone conference at 11:30 with the Governor- Congressman Kildee at 11:30 am

From: Moran, Susan (DCH)
Sent: Monday, September 28, 2015 10:09 AM
To: Lyon, Nick (DCH)
Cc: Robinson, Mikelle (DCH); Wells, Eden (ewells@umich.edu); Hertel, Elizabeth (DCH); Lasher, Geralyn (DCH); Grijalva, Nancy (DCH); Becker, Timothy (DCH); Dykema, Linda D. (DCH); Miller, Corinne (DCH); Anderson, Paula (DCH)
Subject: Re: Proposed Press Conference on Flint Drinking Water

Lynda Dykema is the contact for questions on Virginia Tech/Hurley data.

Sent from my iPhone

On Sep 28, 2015, at 7:52 AM, Lyon, Nick (DCH) <LyonN2@michigan.gov> wrote:

Director Wyant and I agreed this morning to establish a team to look at the recommendations below in preparation for a joint press conference later this week. I did modify one and remove one from his original email. He was suggesting an outside public health advisor. I think it's appropriate that this be our CME so I changed that piece. I volunteered Geralyn, Elizabeth, and Dr. Wells to serve on the team.

The areas where we need more attention are as follows:

- 1) I need an analysis of the Virginia Tech/Hurley data and their conclusions. I would like to make a strong statement with a demonstration of proof that the lead blood levels seen are not out of the ordinary and are attributable to seasonal fluctuations. Geralyn is working on this for me but she needs someone in public health who can work directly with her on immediate concerns/questions. Sue -- Please get her a name immediately.
- 2) I need an understanding of what WIC will pay for and when. We are hearing that the USDA is indicating that premade formula can be provided. Internal WIC staff don't seem to be saying the same things. And there may also be a supply issue. Elizabeth is following up for me on this.
- 3) Elizabeth will also follow up with Terry Beuer to see what FNS will pay for on the food assistance side, or if there are other programs that may cover water or premade formula.
- 4) I think we did a good job getting the local public health department involved and I ask that we work in concert with him. The recommendation is that they be included in the press event this week.

We need immediate action on these. I have a follow up phone call early this afternoon. I also ask that any requests coming from the team be treated with great urgency. The expectation is that we will get on top of this and provide leadership on the issue.

Nick

From: Wyant, Dan (DEQ)
Sent: Monday, September 28, 2015 7:18 AM
To: Muchmore, Dennis (GOV); Lyon, Nick (DCH); Hollins, Harvey (GOV)
Cc: Wurfel, Sara (GOV); Wurfel, Sara (GOV); Lasher, Geralyn (DCH); Thelen, Mary Beth (DEQ)
Subject: Proposed Press Conference on Flint Drinking Water

Per the ongoing issues in Flint concerning their drinking water, I would offer the following recommendations. Let's discuss.

Recommendation

Press Conference in Flint – Wednesday, Thursday or Friday.

Participants

Mayor of Flint
Dan Wyant – Michigan Department of Environmental Quality
Nick Lyon – Department of Community Health
Susan Hedman – Region 5 Administrator or EPA
Harvey Hollins – Governor's office
Local Public Health Department

Announcement

Federal – State – Local action plan to address Flint Drinking Water

1. Governor Snyder names Dr. Eden Wells (DHHS Chief Medical Executive) as Flint drinking water Public Health Advisor.

2. All Flint schools water will immediately be tested to ensure that drinking water is safe.
3. Advisories will be disseminated recommending citizens flush your cold water pipes, use only water from the cold water tap for drinking, cooking and especially for making baby formula.
4. Implementation of fully optimized corrosion controls in the Flint drinking water system.
5. Expanded water testing of at risk properties.
6. Offer water testing at no cost to Flint residents to assure water is safe.
7. Convene a safe drinking water " Technical Review Advisory" to ensure best technology, practices and science is being utilized, including EPA's expertise and assistance from their Office of Research and Development.
8. Offer bottled water and premixed formula if test results indicate high levels of lead.

Dan Wyant, Director
Department of Environmental Quality
517-284-6700 (New Number)

From: Miller, Mark (DHHS)
Sent: Monday, September 28, 2015 5:06 PM
To: 'Valacak, Mark'
Subject: RE: State lead testing results???

Not yet. Just had a conf. call with the Epis. They're crunching data and trying to duplicate Hurley's process. I told them about the zip code issue. I'll get back with you when they complete their analysis.

Thanks.

From: Valacak, Mark [mailto:MVALACAK@gchd.us]
Sent: Monday, September 28, 2015 1:57 PM
To: Miller, Mark (DCH) ; Travis, Rashmi (DCH)
Subject: RE: State lead testing results???

Mark & Rashmi,

I want to know whether you have confirmed with the lead program staff at MDHHS that the state results that purport that lead levels have not shown a significant increase since the changeover of the water supply for the city of Flint indeed represent Flint city zip codes only and not Flint mailing addresses. As I mentioned to you both this morning, Flint mailing addresses would include outlying areas like Flint and Mundy Townships which obtain their water from the Detroit Water Authority.

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us



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From: Miller, Mark (DCH) [mailto:millerm1@michigan.gov]
Sent: Monday, September 28, 2015 11:28 AM
To: Valacak, Mark
Subject: testing

So they're wondering about testing capacity up here.

If the City of Flint gets a big deluge of requests, will they be able to handle them? Would they need additional assistance? Have they projected any expected demand? They are currently testing right?

Thanks!

Mark Miller
Director, Local Health Services
Michigan Department of Health & Human Services
201 Townsend, 6th Floor
Lansing MI 48913
(517) 335-8032
millerm1@michigan.gov

From: Travis, Rashmi (DHHS)
Sent: Monday, September 28, 2015 2:33 PM
To: Valacak, Mark; Miller, Mark (DHHS)
Subject: RE: State lead testing results???

Mark,

We spoke with Nancy Peeler this morning, who was going to get some info from our Epi staff on breaking out the data on the outlying areas. I have not heard back yet.

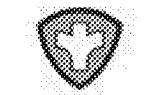
Rashmi

From: Valacak, Mark [<mailto:MVALACAK@gchd.us>]
Sent: Monday, September 28, 2015 1:57 PM
To: Miller, Mark (DCH); Travis, Rashmi (DCH)
Subject: RE: State lead testing results???

Mark & Rashmi,

I want to know whether you have confirmed with the lead program staff at MDHHS that the state results that purport that lead levels have not shown a significant increase since the changeover of the water supply for the city of Flint indeed represent Flint city zip codes only and not Flint mailing addresses. As I mentioned to you both this morning, Flint mailing addresses would include outlying areas like Flint and Mundy Townships which obtain their water from the Detroit Water Authority.

Mark Valacak, MPH, Health Officer
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From: Miller, Mark (DCH) [<mailto:millerm1@michigan.gov>]
Sent: Monday, September 28, 2015 11:28 AM
To: Valacak, Mark
Subject: testing

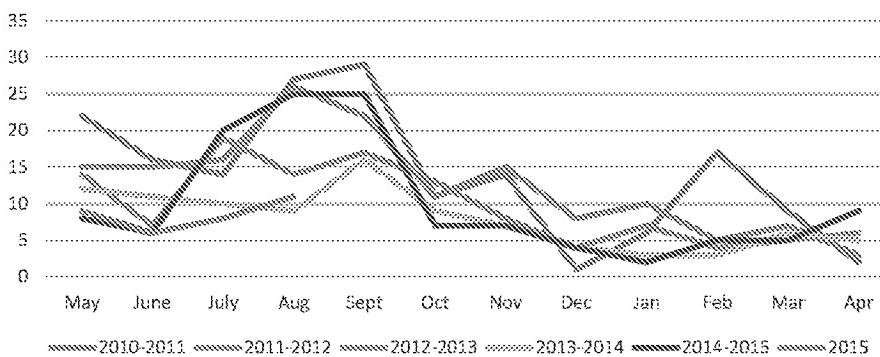
So they're wondering about testing capacity up here.

If the City of Flint gets a big deluge of requests, will they be able to handle them? Would they need additional assistance? Have they projected any expected demand? They are currently testing right?

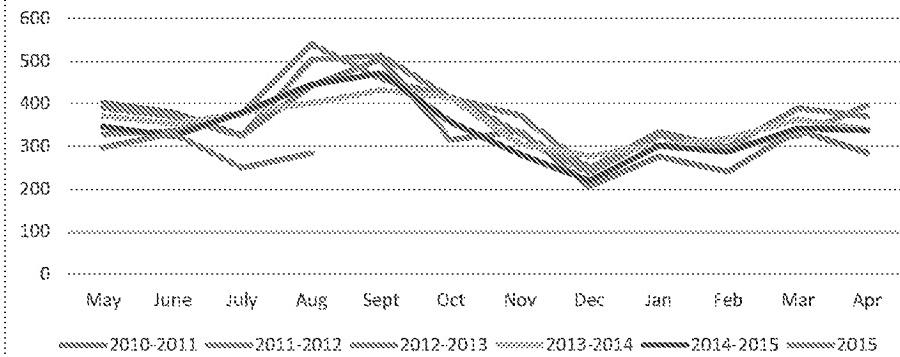
Thanks!

Mark Miller
Director, Local Health Services
Michigan Department of Health & Human Services
201 Townsend, 6th Floor
Lansing MI 48913
(517) 335-8032
millerm1@michigan.gov

**City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels***



**City of Flint, Children less than 16 years of age
Tested for Lead Poisoning**



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	22	16	14	27	29	11	14	1	6	17	9	2
2011-2012	15	15	16	26	22	11	15	8	10	5	7	3
2012-2013	14	7	19	14	17	13	8	4	7	4	5	6
2013-2014	12	11	10	9	16	9	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	4	2	5	5	9
2015	9	6	8	11								

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	402	379	325	442	504	315	335	206	276	240	338	285
2011-2012	390	370	324	503	512	413	372	248	333	298	389	370
2012-2013	328	335	376	540	458	416	331	237	325	298	325	397
2013-2014	371	353	378	401	432	414	305	277	304	319	363	339
2014-2015	346	324	379	445	471	357	281	219	301	287	342	337
2015	297	330	249	284								

*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Less than 16 years of age at time of test

Includes only first-time blood lead levels $\geq 5 \text{ ug/dL}$

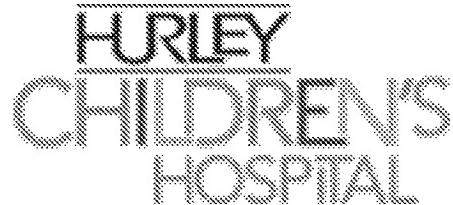
Includes sample type of venous, capillary or unknown

September 23, 2015

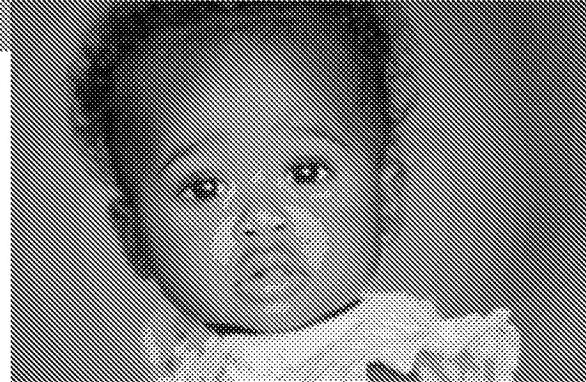
Source: MDHHS Data Warehouse, Lead Specimen table

PEDIATRIC LEAD EXPOSURE IN FLINT, MICHIGAN: A FAILURE OF PRIMARY PREVENTION

Mona Hanna-Attisha MD MPH FAAP
Hurley Children's Hospital
Michigan State University Department of
Pediatrics and Human Development



Introducing Makayla*



- 12 month old girl (DOB 8/15/2014) presented last week for her 1 year old check up. No concerns.
- Lives with single mom and 2 older siblings in west side (48504). Formula from WIC; powder mixed with warm tap water.
- Physical exam and development are normal. Makayla receives her 1 year old vaccines and routine lead and hemoglobin screening.
- *A couple days later, lead level comes back as 6 ug/dL.*

*Hypothetical scenario

Blood lead level of 6 ug/dL... . . .

- Blood lead levels (BLL) above 5 ug/dL are considered elevated blood lead levels (EBL)
- Just a few years ago (2012), 10 ug/dL was cutoff
- Increasing evidence shows NO safe blood lead level
- Disproportionately impacts low income, minority children
- Primary prevention is most important

Primary Prevention

- “Because no measurable level of blood lead is known to be without deleterious effects, and because once engendered, the effects appear to be irreversible in the absence of any other interventions, public health, environmental and housing policies should encourage PREVENTION of all exposure to lead.”

“Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention.”
2012 CDC Advisory Committee on Childhood Lead Poisoning Prevention.

What will happen to Makayla?

- Vast evidence supports increased likelihood of:
 - Decrease in IQ
 - An increase in BLL from 1 to 4 ug/dL, drops mean IQ -3.7 points
 - Small change in mean IQ, shifts entire population IQ distribution
 - Reduces high achievers IQs (>130) and increases kids with low IQs (<70)
 - Implications for special education services, employment, incarceration, life achievement, etc

Lanphear BP et al., Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. Environ Health Perspect, 2005. 113:894-9.

Fewtrell LJ, Pruss-Ustun A, Landrigan P, and Ayuso-Mateos JL, Estimating the global burden of disease of mild mental retardation and cardiovascular diseases from environmental lead exposure. Environmental Research, 2004. 94:120-33.

Behavioral Burden

- Increased likelihood of :
 - ADHD behaviors
 - Delinquent behaviors and arrests
 - Total arrests and increased rates of arrests involving violent offenses
 - Other health effects: hematologic, cardiovascular, immunologic, endocrine, etc

Wright, JP, KN Dietrich, MD Ris, et al. 2008. Association of prenatal and childhood blood lead concentrations with criminal arrests in early adulthood. *PLoS Med* 5(5): e101

Chen, A, B Cai, KN Dietrich, et al. 2007. Lead exposure, IQ, and behavior in urban 5-7 year-olds: Does lead affect behavior only by lowering IQ? *Pediatrics* 119(3): e650-e658.

Needleman, HL, C McFarland, RB Ness, et al. 2002. Bone lead levels in adjudicated delinquents: A case control study. *Neurotoxicology and Teratology* 24(6):711-717.

The Cost

- “For childhood lead poisoning, \$5.9 million in medical care costs, as well as an additional \$50.9 billion (sensitivity analysis: \$44.8–\$60.6 billion) in lost economic productivity resulting from reduced cognitive potential from preventable childhood lead exposure.”
- “The present value of Michigan’s economic losses attributable to lead exposure in the 2009 cohort of 5 year-olds ranges from \$3.19 (using U.S. blood lead levels) to \$4.85 billion (using Michigan blood lead levels) per year in loss of future lifetime earnings.”

Leonardo Trasande and Yinghua Liu. Reducing The Staggering Costs Of Environmental Disease In Children, Estimated At \$76.6 Billion In 2008. *Health Affairs*, 30, no.5 (2011):863-870

The Price of Pollution: Cost Estimates of Environment-Related Childhood Diseases in Michigan. 2010 Report by Michigan Network of Children’s Environmental Health

Lead in Water

- Increasing as source of lead, because of success in controlling other sources.
- Increasing due to aging water infrastructures, change in water sources, disinfectant uses, etc
- Disproportionally impacts developmentally-vulnerable formula-fed infants and pregnant mothers
 - For about 25% of infants drinking formula made from tap water at 10 ppb, blood lead would rise above the CDC level of concern of 5 micrograms/deciliter (or ug/dL).
 - Increase in fetal death and reduced birth weights

Triantafyllidou, S., Gallagher, D. and Edwards, M. Assessing risk with increasingly stringent public health goals: the case of water lead and blood lead in children. *Journal of Water and Health*. doi: 10.2166/wh.2013.067 58-68 (2014).

Edwards, M. Fetal Death and Reduced Birth Rates Associated with Exposure to Lead-Contaminated Drinking Water. *Env. Sci. and Tech.* 2013 DOI: 10.1021/es4034952



PRELIMINARY RESULTS

Preliminary Results of Pediatric Blood Lead Levels (BLL)

• Methods

- Data from all blood lead levels processed at Hurley Medical Center
- HMC Institutional Review Board (IRB) approved
- All children 5 years of age and younger
- Zip codes 48501-48507
- Two periods of comparison:
 - PRE-SWITCH: January 1, 2013 – September 15, 2013
 - POST-SWITCH: January 1, 2015 – September 15, 2015
- Analyzed % Elevated Blood Lead (EBL)
 - EBL = Blood lead Levels > 5 g/dL

Blood Lead Level Analysis

- Large sample size
 - N= 1746 for Flint children (pre n=906, post n=840)
 - N= 1670 for non-Flint children (pre n=943, post n=727)

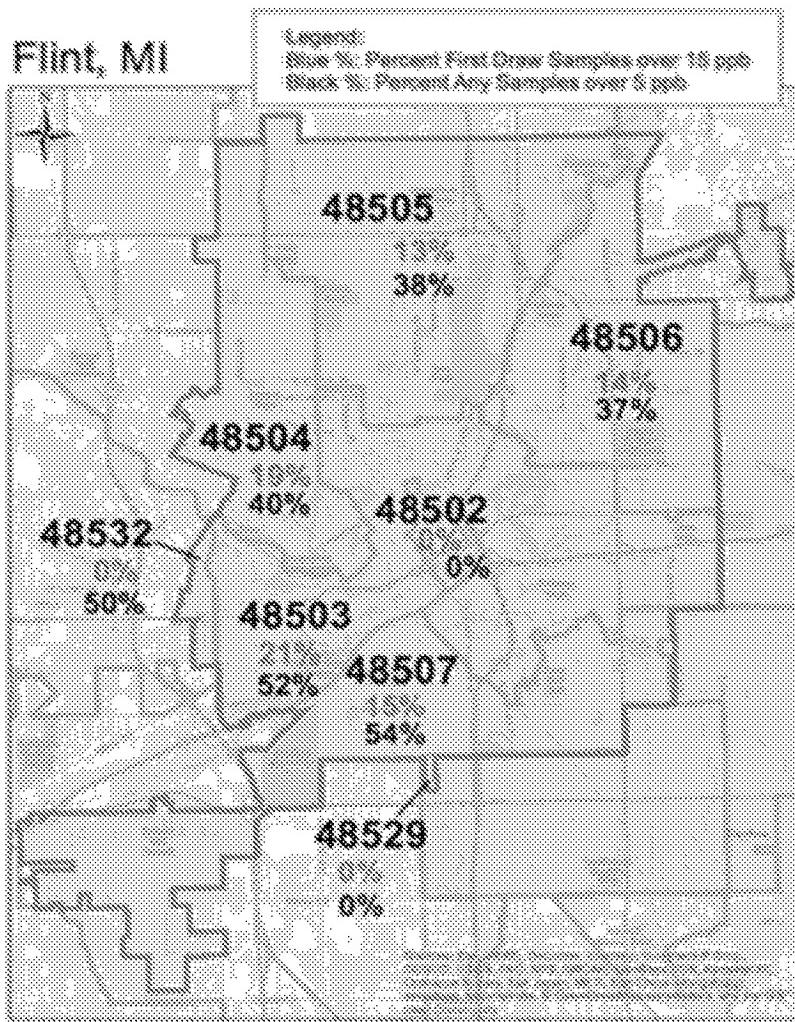
Flint results for children 5 years and under:

PRE-SWITCH % EBL = 2.1% (consistent with MDHHS data 2.2)

POST-SWITCH % EBL = 4.0%

p < 0.05; STATISTICALLY SIGNIFICANT CHANGE

High Risk Zip Codes Results



- Focus on zip codes (48503 and 48504) with high water lead levels
- Total n=742, pre n=394, post n=348
 - Results:
 - PRE-SWITCH % EBL: 2.5%
 - POST-SWITCH % EBL: 6.3%
 - **p < 0.05; STATISTICALLY SIGNIFICANT CHANGE**

What was rest of county doing?

- Analysis of same time periods for Genesee County children who live outside of City of Flint zip codes (non 48501-48507)
 - N=1670 for non-Flint children (pre n=943, post n=727)

Non-Flint results for children 5 years and under:

PRE-SWITCH % EBL = 0.6%

POST-SWITCH % EBL = 1.0%

p = 0.637; NO CHANGE

Blood Lead Level Analysis

- % EBL all children less than 5 years of age

	ALL FLINT (n=1746)	HIGH-RISK FLINT (n=742)	REST OF FLINT (n=1004)	NON-FLINT (n=1670)
<i>PRE-SWITCH</i>	2.1%	2.5%	1.8%	0.6%
<i>POST-SWITCH</i>	4.0%	6.3%	2.4%	1.0%

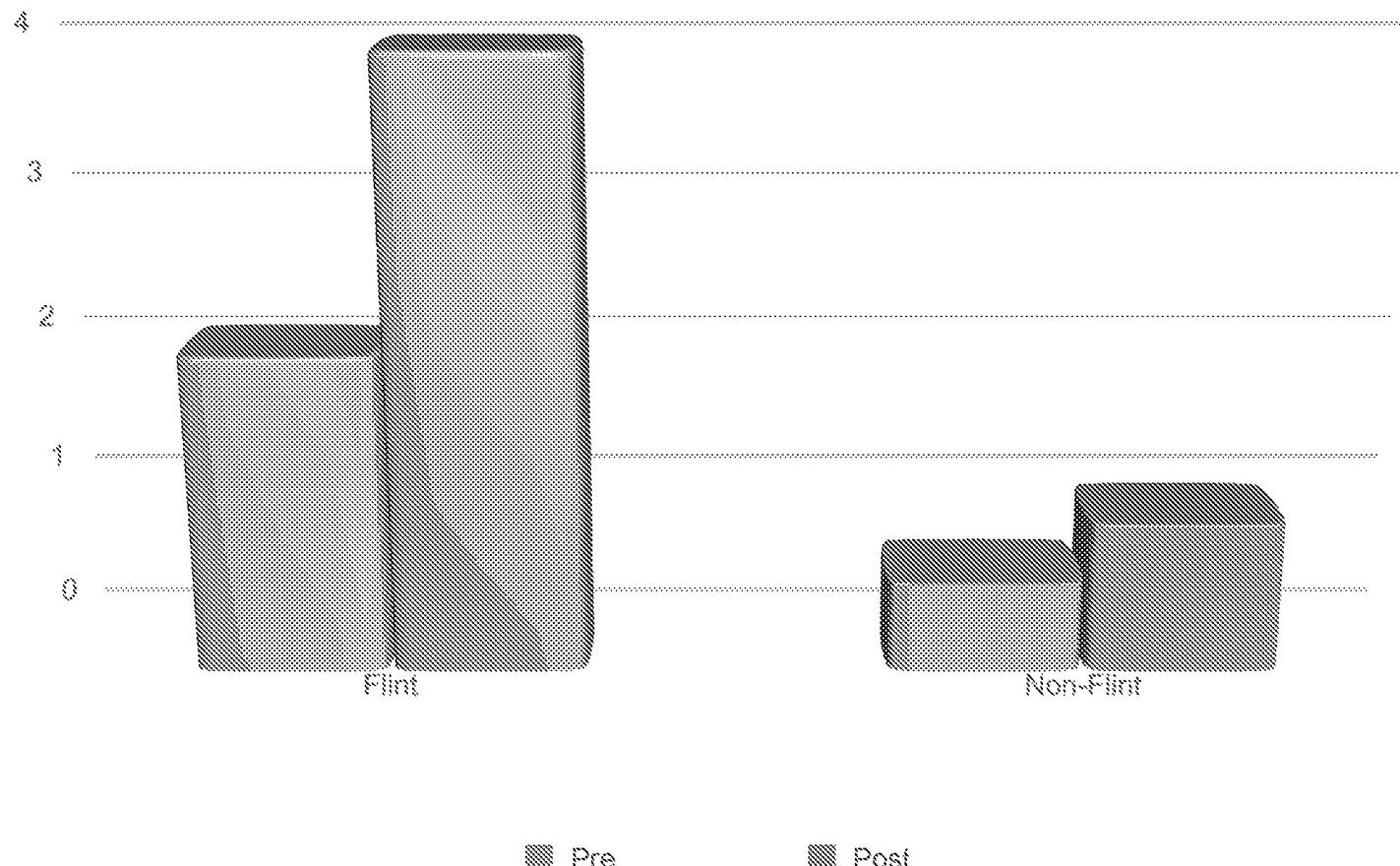
Blood Lead Level Analysis

- % EBL children 15 months or less
 - Total Flint n=619, pre n=295, post n=324
 - Total Non-Flint n=816, pre n=443, post n=376

	HIGH-RISK FLINT (n=269)	REST OF FLINT (n=350)	NON-FLINT (n=816)
<i>PRE-SWITCH</i>	1.5%	0.6%	0.5%
<i>POST-SWITCH</i>	4.4%	1.1%	0.5%

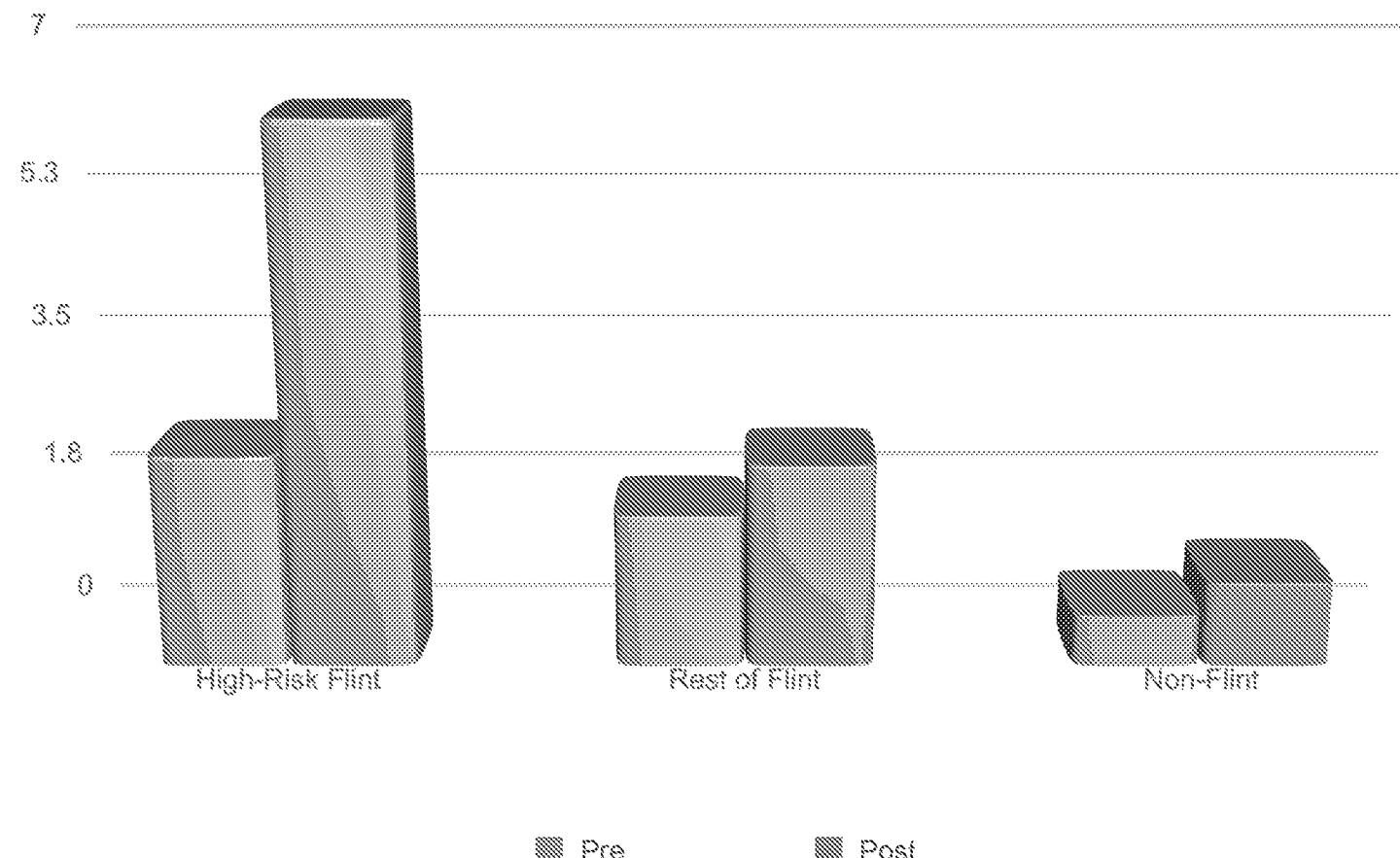
Graphical Summary

Change in % EBL Flint vs Non-Flint



Graphical Summary

Change in % EBL by area



Conclusions from BLL analysis

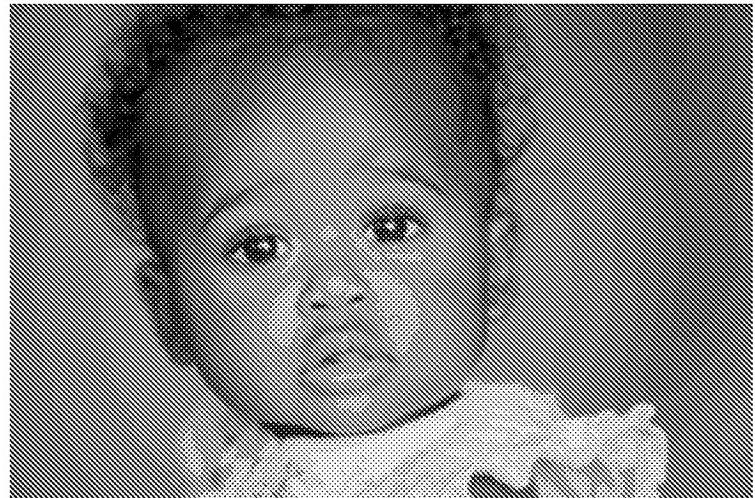
- % of children with EBL in Flint has increased
 - Most striking increase in zip codes with highest water lead levels
- Results underestimate risk: infants not screened for lead and water usage unknown.
 - *Accurate exposure largely unknown since national childhood lead screening focuses on household lead exposure (paint, soil, dust) at later ages (1 and 2 yrs)*
- Results are consistent and concerning. Primary prevention has failed.

Next Steps

- Immediately limit further exposure
 - Encourage breast feeding
 - No tap water for high risk groups: infants on formula & pregnant mothers
 - Declare health advisory: allows WIC to administer water or ready-to-feed formula and other resources (Salvation Army & United Way water supplies)
 - Distribution of lead clearing NSF-approved filters
 - Public education regarding precautions (flushing, etc)
 - Re-connect to Lake Huron water source ASAP

And Makayla . . .

- Asymptomatic now
- But what will her future hold and an entire generation of Flint children?



~~first H2O~~

- Oct City - ~~water cause~~ ~~ecology cleaner~~
- Flint River (environ, Dec) ~~water cause~~ ~~disolved sed~~
- ~~qual. fail
2000 ft
1500 sec
1500 sec~~
- Va. Virgin. ~~test~~ ~~RSRZ~~ ? slow. ~~caus~~ in ~~solve sample~~
- Hrolgy - Double in some ZIPS
- Our Data initially No BUT in Retrospect Supporter

Be: L'eau vs H₂O

- Lots of people: Gour, Mallets, Gout, Flint Mayday
front water, SPA, various of clean groups
~~WHD~~

~~front water~~
~~1550 ft~~
Much yelling + screaming

- Advising / Em ORCA - NOT TO DRINK H₂O
 - water - TESTED
 - filter
 - flush
- filter + Mallets

Robinson, Mikelle (DCH)

From: Wells, Eden (DHHS)
Sent: Thursday, October 01, 2015 3:39 PM
To: Moran, Susan (DHHS); Robinson, Mikelle (DHHS)
Subject: Fw: Talking Points

From: Miller, Corinne (DHHS)
Sent: Thursday, October 1, 2015 2:18 PM
To: Dykema, Linda D. (DHHS); LyonCallo, Sarah (DHHS); Priem, Wesley F. (DHHS); Wells, Eden (DHHS)
Subject: RE: Talking Points

Eden,

More analysis and review has been done by Sarah's staff. Here are the talking points:

The high risk Zip codes (48503 and 48504)

Blood lead level rates among children under six years of age in the high risk Zip codes (48503, 48504) were 2.7 times higher than the rest of Genesee County before the switch to Flint River Water ($p<0.0001$). After the switch to Flint River Water, rates in the high risk Zip codes were 3.2 times that of the rest of Genesee County ($p<0.0001$).

Thus, compared to rates during 2010-2013, the rates after the switch to Flint River water in the high risk Zip codes increased 18 percent, although this difference did not reach statistical significance.

Other Zip codes in Flint

Rates of elevated blood lead levels among children under six years of age in other parts of the city of Flint were 2 times that of the rest of Genesee County before the switch to Flint River Water ($p<0.0001$). The magnitude of the elevated rate remained roughly the same during the period after the water source switch.

From: Dykema, Linda D. (DHHS)
Sent: Thursday, October 01, 2015 1:06 PM
To: Miller, Corinne (DHHS); LyonCallo, Sarah (DHHS); Priem, Wesley F. (DHHS); Wells, Eden (DHHS)
Subject: RE: Talking Points
Importance: High

2 things:

- Leaded gasoline has been banned for use in road vehicles since 1996, so it's not likely that Flint kids would be exposed that way
- The sentence "Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply" is not completely accurate and could be challenged. On the call with EPA today I heard that maybe 50% of the city's lead supply lines are lead...these are outside the house

and would include the portion of the run owned by the resident and the portion owned by the city water supply.

From: Miller, Corinne (DHHS)
Sent: Thursday, October 01, 2015 12:38 PM
To: LyonCallo, Sarah (DHHS); Dykema, Linda D. (DHHS); Priem, Wesley F. (DHHS)
Subject: Fwd: Talking Points

Sent from my iPhone

Begin forwarded message:

From: "Eisner, Jennifer (DHHS)" <EisnerJ@michigan.gov>
Date: October 1, 2015 at 11:51:51 AM EDT
To: "Miller, Corinne (DHHS)" <MillerC39@michigan.gov>, "Robinson, Mikelle (DHHS)" <RobinsonM18@michigan.gov>
Cc: "Wells, Eden (DHHS)" <WellsE3@michigan.gov>
Subject: Talking Points

Corinne and Mikelle:

Attached please find the most recent Flint talking points which include edits from Dr. Wells. A 12:30 meeting with the gov's comms team was just called, so we need to have them finalized and ready to share asap.

Can you please send me the bullet points explaining the data – or what is ready of them – by noon?

Thank you,

Jennifer (Smith) Eisner
Public Information Officer
Michigan Department of Health and Human Services
517-241-2112

Robinson, Mikelle (DHHS)

From: Dykema, Linda D. (DCH)
Sent: Monday, September 28, 2015 10:52 AM
To: Moran, Susan (DHHS); Lyon, Nick (DHHS)
Cc: Robinson, Mikelle (DHHS); Wells, Eden (ewells@umich.edu); Hertel, Elizabeth (DHHS); Lasher, Geralyn (DHHS); Grijalva, Nancy (DHHS); Becker, Timothy (DHHS); Miller, Corinne (DHHS); Anderson, Paula (DHHS); LyonCallo, Sarah (DHHS)
Subject: RE: Proposed Press Conference on Flint Drinking Water

Sarah Lyon-Calio is pursuing the Flint blood lead data for comparison to the Hurley data results. I'll look into the VA Tech study.

Linda D. Dykema, Ph.D.

Environmental Public Health Director
Division of Environmental Health
Michigan Department of Health & Human Services
517.335.8566
dykemal@michigan.gov

From: Moran, Susan (DCH)
Sent: Monday, September 28, 2015 10:09 AM
To: Lyon, Nick (DCH)
Cc: Robinson, Mikelle (DCH); Wells, Eden (ewells@umich.edu); Hertel, Elizabeth (DCH); Lasher, Geralyn (DCH); Grijalva, Nancy (DCH); Becker, Timothy (DCH); Dykema, Linda D. (DCH); Miller, Corinne (DCH); Anderson, Paula (DCH)
Subject: Re: Proposed Press Conference on Flint Drinking Water

Lynda Dykema is the contact for questions on Virginia Tech/Hurley data.

Sent from my iPhone

On Sep 28, 2015, at 7:52 AM, Lyon, Nick (DCH) <LyonN2@michigan.gov> wrote:

Director Wyant and I agreed this morning to establish a team to look at the recommendations below in preparation for a joint press conference later this week. I did modify one and remove one from his original email. He was suggesting an outside public health advisor. I think it's appropriate that this be our CME so I changed that piece. I volunteered Geralyn, Elizabeth, and Dr. Wells to serve on the team.

The areas where we need more attention are as follows:

- 1) I need an analysis of the Virginia Tech/Hurley data and their conclusions. I would like to make a strong statement with a demonstration of proof that the lead blood levels seen are not out of the ordinary and are attributable to seasonal fluctuations. Geralyn is working on this for me but she needs someone in public health who can work directly with her on immediate concerns/questions. Sue – Please get her a name immediately.

- 2) I need an understanding of what WIC will pay for and when. We are hearing that the USDA is indicating that premade formula can be provided. Internal WIC staff don't seem to be saying the same things. And there may also be a supply issue. Elizabeth is following up for me on this.
- 3) Elizabeth will also follow up with Terry Beuer to see what FNS will pay for on the food assistance side, or if there are other programs that may cover water or premade formula.
- 4) I think we did a good job getting the local public health department involved and I ask that we work in concert with him. The recommendation is that they be included in the press event this week.

We need immediate action on these. I have a follow up phone call early this afternoon. I also ask that any requests coming from the team be treated with great urgency. The expectation is that we will get on top of this and provide leadership on the issue.

Nick

From: Wyant, Dan (DEQ)

Sent: Monday, September 28, 2015 7:18 AM

To: Muchmore, Dennis (GOV); Lyon, Nick (DCH); Hollins, Harvey (GOV)

Cc: Wurfel, Sara (GOV); Wurfel, Sara (GOV); Lasher, Geralyn (DCH); Thelen, Mary Beth (DEQ)

Subject: Proposed Press Conference on Flint Drinking Water

Per the ongoing issues in Flint concerning their drinking water, I would offer the following recommendations. Let's discuss.

Recommendation

Press Conference in Flint – Wednesday, Thursday or Friday.

Participants

Mayor of Flint

Dan Wyant – Michigan Department of Environmental Quality

Nick Lyon – Department of Community Health

Susan Hedman – Region 5 Administrator or EPA

Harvey Hollins – Governor's office

Local Public Health Department

Announcement

Federal – State – Local action plan to address Flint Drinking Water

1. Governor Snyder names Dr. Eden Wells (DHHS Chief Medical Executive) as Flint drinking water Public Health Advisor.
2. All Flint schools water will immediately be tested to ensure that drinking water is safe.

3. Advisories will be disseminated recommending citizens flush your cold water pipes, use only water from the cold water tap for drinking, cooking and especially for making baby formula.
4. Implementation of fully optimized corrosion controls in the Flint drinking water system.
5. Expanded water testing of at risk properties.
6. Offer water testing at no cost to Flint residents to assure water is safe.
7. Convene a safe drinking water " Technical Review Advisory" to ensure best technology, practices and science is being utilized, including EPA's expertise and assistance from their Office of Research and Development.
8. Offer bottled water and premixed formula if test results indicate high levels of lead.

Dan Wyant, Director
Department of Environmental Quality
517-284-6700 (New Number)



Robinson, Mikelle (DHHS)

From: Miller, Mark (DCH)
Sent: Friday, September 25, 2015 2:39 PM
To: Priem, Wesley F. (DHHS); Travis, Rashmi (DHHS); Hertel, Elizabeth (DHHS); Eisner, Jennifer (DHHS); Dykema, Linda D. (DHHS); Minicuci, Angela (DHHS)
Cc: Robinson, Mikelle (DHHS); Moran, Susan (DHHS)
Subject: FW: water issue
Attachments: Lead Advisory Release.pdf

FYI, issued today after the press conference today.

mark

From: Valacak, Mark [mailto:MVALACAK@gchd.us]
Sent: Friday, September 25, 2015 2:35 PM
To: Robinson, Mikelle (DCH)
Cc: Miller, Mark (DCH)
Subject: RE: water issue

Attached is the lead advisory issued by the city of Flint.

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us



Public Health

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From: Robinson, Mikelle (DCH) [mailto:RobinsonM18@michigan.gov]
Sent: Thursday, September 24, 2015 2:27 PM
To: Valacak, Mark
Subject: RE: water issue

Great, thank you!

From: Valacak, Mark [mailto:MVALACAK@gchd.us]
Sent: Thursday, September 24, 2015 2:22 PM

To: Robinson, Mikelle (DCH)
Subject: RE: water issue

Mikelle,

Happy to work with you on this and appreciate any assistance the state can provide. The "lead in water" fact sheet is posted to our website <http://www.gchd.us/> under the popular pages column. We sent our recommended revisions to the city water department for the advisory and will forward that when it is available.

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us



Public Health
Genesee County Health Department

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"There are two lasting bequests we can hope to give our children: one is roots; the other is wings." Hodding Carter

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From: Robinson, Mikelle (DCH) [<mailto:RobinsonM18@michigan.gov>]
Sent: Thursday, September 24, 2015 2:12 PM
To: Valacak, Mark
Cc: Miller, Mark (DCH)
Subject: water issue

Hi Mark,

Thank you for taking time to talk with me earlier. Attached are MDHHS talking points. Were you able to finalize and post your county fact sheet? Please forward a copy to me if possible.

Also, I mentioned that we were looking into what D.C. did previously on this issue and this is an excerpt from their plan. FYI in case it is useful to you.

Following the LCR ([U.S. EPA 1991](#)), guidance from the U.S. EPA, consultation with the DC Department of Health, and its own contingency plans, in 2003 the DCWASA implemented plans for families living in homes with lead lines or testing above the LAL:

- Advisories were disseminated recommending that water lines should be flushed for 10 min before consuming drinking water.
- Specific advice for limiting exposure to children < 6 years of age and pregnant and nursing women was sent to all households with suspected lead service lines, in the form of flyers prepared in English, Spanish, Korean, Chinese, Vietnamese, and Amharic.

- Filters were distributed to homes with suspected lead service lines and later to all homes with a test result > 15 ppb (the LAL). Replacement filter cartridges were then sent to the same homes at 6-month intervals for the duration of the period of the exceedance, ending in June 2006.
- The board of directors of the DCWASA decided to adopt a voluntarily accelerated program to replace the public segment of all lead service lines in the District of Columbia, exceeding requirements of the LCR (U.S. EPA 1991).
- Homeowners were offered replacement of the private segment of lead service lines on their property, at cost, at the same time that the public segments of the lead service lines were replaced. When the public line is replaced but the private line is not, lead levels are reduced proportionally to the length of pipe replaced but not eliminated.
- Low-cost financing was arranged with a local bank for qualifying property owners who wished to replace the private part of the lead service line on their property. The DC government later made grants available to low-income eligible residents for this purpose.
- The DCWASA offered free water testing to any customer in the distribution area who requested it.

Thank you.

Mikelle

Mikelle Robinson
Director, Local Health & Administrative Services
Population Health & Community Services
MDHHS
(517) 335-8701
Robinsonm18@michigan.gov



Blood Lead Levels in Flint Talking Points

October 1, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley.
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - There is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 03 and 04. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
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- Our first action item is to work closely with our public and private partners to provide water filters to Flint residents and MDHHS clients.
- To meet this priority, the governor has identified one million dollars in state funding to purchase water filters for Flint residents.
- Given the questions and concerns regarding the change in water source in Flint, MDHHS has authorized the use of emergency services funding to provide water filters for MDHHS clients receiving assistance in the city of Flint.
- We are pursuing a plan for clients who are active Family Independence Program (FIP), Food Assistance Program (FAP), Child Development and Care (CDC), State Disability Assistance (SDA), State Disability Assistance (SDA), or Social Security Insurance (SSI) to that they can obtain filters that are National Sanitation Foundation (NSF) certified to remove lead and ANSI Standard 53.
- We are in discussions with local retailers and will share additional information about where residents can go to purchase filters as soon as those details have been finalized.

- MDHHS currently serves approximately 25,000 households in Flint.

Reducing and Removing Lead Exposure

- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
- Make sure your child does not have access to peeling paint or chewable surfaces painted with lead-based paint.
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- Create barriers between living/play areas and lead sources. Until environmental clean-up is completed, you should clean and isolate all sources of lead.
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- Take off shoes when entering the house to prevent bringing lead-contaminated soil in from outside.
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 - Until the bare soil is covered, move play areas away from bare soil and away from the sides of the house. If you have a sandbox, cover the box when not in use to prevent cats from using it as a litter box. That will help protect children from exposure to animal waste.
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- Remove recalled toys and toy jewelry immediately from children.
- Use only cold water from the tap for drinking, cooking, and making baby formula. Hot water is more likely to contain higher levels of lead. Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.

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- Each household would have to be looked at on an individual basis.
 - WIC cannot cover bottled water.

Background

- The results of the Hurley Children's Hospital were reviewed by MDHHS after the study was released last week.
- The analysis that Hurley conducted was different from the initial MDHHS data regarding blood lead levels in Flint.
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- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. Further, seasonal variations in water can occur due to changes in temperature, pH , and other factors

Blood Lead Levels in Flint Talking Points

September 24, 2015

MDHHS
9/24

- The results of the Hurley Children's Hospital are under review by the Michigan Department of Health and Human Services.
- The analysis that Hurley conducted is different from the way MDHHS has analyzed data regarding blood lead levels in Flint.
- MDHHS is looking to see if we can replicate the results of the Hurley study to see how they achieved their results.

Differences in Analysis

- MDHHS data provides a much more robust picture of the entire blood lead levels for the Flint area, and specifically, accounts for data over the full course of the past five years.
- Looking at the past five years as a whole provides a much more accurate look at the seasonal trends of lead in the area.
- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. This seasonal increase would be unrelated to the water system.
- Our data includes children from the entire city, including all medical facilities, rather than just Hurley, has a larger age group of children, and includes a much larger sample size.
- The MDHHS analysis looks specifically at the first elevated blood lead level for each child, which provides an accurate picture of when first exposure occurred.
- The Hurley data includes a smaller sample size, much more limited time period (January-September of 2013 and 2015 only), and a smaller age group of children.

WIC Children

- In homes with infants on WIC, if the household has documentation from an official source of unsanitary water supply issues, that family may be eligible to receive ready-to-feed formula.
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- WIC cannot cover bottled water.

WIC KRISTEN HANSICIDE: made injury
BUT no response to Q on
Farmat

LEAD DATA
9/28/15
CNA
LNOA D-
COPPER
PLATE MT
SARMT
Pector

1 - Virginia Tech Data: Linda to Ogden

2 - EBC Visits : Was Preem

3 - City of Flint: Kristen trying to
redo the analysis done by Flint Hurley

- LINDA
- ① - Marc Edwards Data
 - Hurley data from Virginia Tech Data
 - Have protocol (sampling)
 - Directions are different than DEQ
 - ? sure preflushing o recommended in other states
 - Out of Control Corrosion of system
 -
 - Some question from EPA (not public) if Flint City sampling was done correctly (as per DEQ)
Report not approved by upper management

TUESDAY
PM - MEET w/ 4pm (Coming to schedule)

SARA

③

W.H have by tomorrow AM (9/28)

- A regression, and stratifies
- 6g < 6 and ?
 - High Risk
 - Gen.
 - Flint only

- Hurley was year pre & year post
- Will have trends

②

West EBL Investigations (6 Houses) DENSITY
WEST, STAFF

(DC did investigation on all houses & kids at elevated lead levels)

9/29 YPA

Lead 9/30 YPA
Data

NP - Nancy P. said COC might have had issue w/
V of V.

LD - Risk CUP - all sources need to be addressed - especially since 90%
are caused by Lead Paint

SUC - 1st Pass - Data description
- Poisson Regression - (Excluoc)

LO - ? High # of H₂O but < 15 ppm

Robinson, Mikelle (DHHS)

From: Dykema, Linda D. (DHHS)
Sent: Monday, October 19, 2015 2:53 PM
To: Wells, Eden (DHHS)
Cc: Moran, Susan (DHHS); Groetsch, Kory J. (DHHS); Gray, Jennifer (DHHS); Priem, Wesley F. (DHHS); Miller, Corinne (DHHS); Miller, Mark (DHHS); Robinson, Mikelle (DHHS)
Subject: RE: DRAFT DELIBERATIVE; NOT SUBJECT TO FOIA - drinking water lead level

Eden,

In the meeting with the city last Friday morning, we talked about forming a technical subgroup for the school drinking water sampling protocol. The subgroup would include DEQ, HHS, GCHD, and some outside entities including possibly Marc Edwards from VATech. The screening value(s) should be part of the approved protocol.

Re blood lead levels in adults, there is a 2004 BEI (Biological Exposure Indices) of 30 µg/dL based on recommendations of the American Conference of Governmental Industrial Hygienists (ACGIH). The 95th percentile from 2012 NHANES tables = 3.9 µg/L.

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Thanks, Linda, for these water limits. Who and when is the decision being made?
Also- for blood lead- adults, DHHS uses a limit of 10 mcg/dl for follow-up---let me know if you have heard something different

Eden V. Wells, MD, MPH, FACPM
MDHHS
Sent from my iPad

On Oct 19, 2015, at 11:48 AM, Dykema, Linda D. (DHHS) <DykemaL@michigan.gov> wrote:

Eden and Sue,

The attached provides the draft justification for screening values to be used to evaluate the results of drinking water sampling efforts at Flint schools.

HHS Division of Environmental Health toxicologist Jennifer Gray conducted the modeling and drafted the justification along with Toxicology and Response Section manager Kory Groetsch. They met with a select group of DEQ toxicologists, incorporated their comments and

suggestions, the obtained concurrence on the appropriateness of the inputs and the conclusions. DEQ Dept. Dir. Jim Sygo has also been provided with the draft justification.

A risk management decision is now needed and there are 2 options: a single screening value of 2 ppb that would apply to all schools including daycares and elementary schools OR a 2-tier approach in which 2 ppb would apply only where children 0-12 months are present, but a higher concentration of 11 ppb would be used to protect children up to 7 years.

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Great on the water testing-

As to blood- well the issue for industrial hygiene (and OSHA) is that they look more towards occupational exposures and levels, less strict measure than DHHS and CDC saying in general adults should be kept under 10.

Sent from my iPhone

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Linda

Blood Lead Levels in Flint Talking Points

October 5, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley.
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - There is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 03 and 04. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
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Water Filters

- Our first action item is to work closely with our public and private partners to provide water filters to Flint residents and MDHHS clients.
- To meet this priority, the governor identified one million dollars in state funding to purchase water filters for Flint residents.
- Free water filters are available to current Michigan Department of Health and Human Services clients and Flint residents at four locations:
 - Flint residents who are not current MDHHS clients should visit one of two Genesee County Community Action Resource Department offices to obtain a filter.
 - at 2727 Lippincott and 601 North Saginaw in Flint
 - Current MDHHS clients in the city of Flint should visit their local MDHHS office
 - At 125 E. Union St. or 4809 Clio Road
- Staff will be onsite at all four locations from 9 a.m. to 4 p.m., Monday through Friday, to distribute filters and assist residents who have questions about proper installation.

- Given the questions and concerns regarding the change in water source in Flint, MDHHS authorized the use of emergency services funding to provide water filters for MDHHS clients receiving assistance in the city of Flint.
- This funding will support active Family Independence Program (FIP), Food Assistance Program (FAP), Child Development and Care (CDC), State Disability Assistance (SDA), State Disability Assistance (SDA), or Social Security Insurance (SSI) recipients so that they can obtain filters that are National Sanitation Foundation (NSF) certified to remove lead and ANSI Standard 53.
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- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
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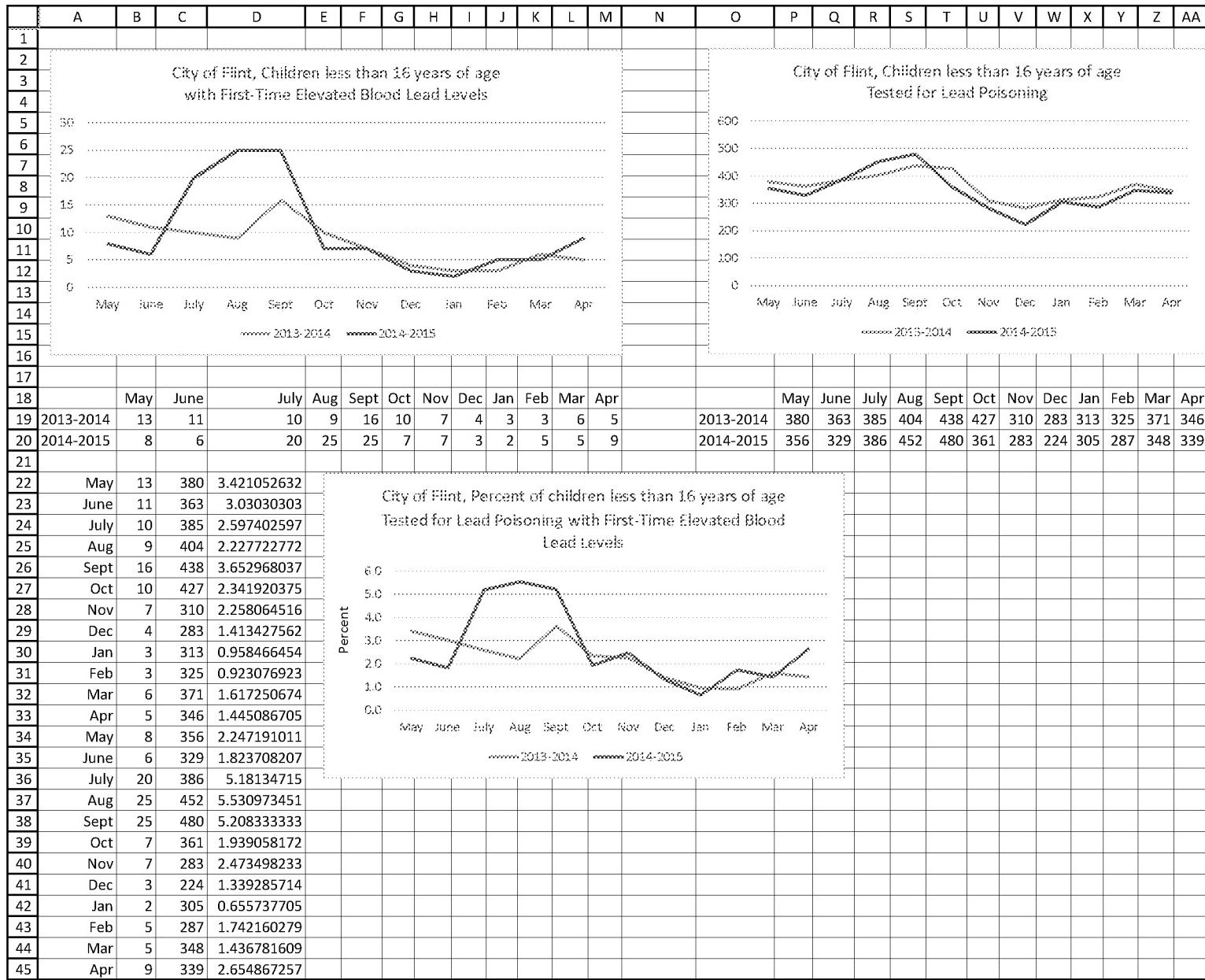
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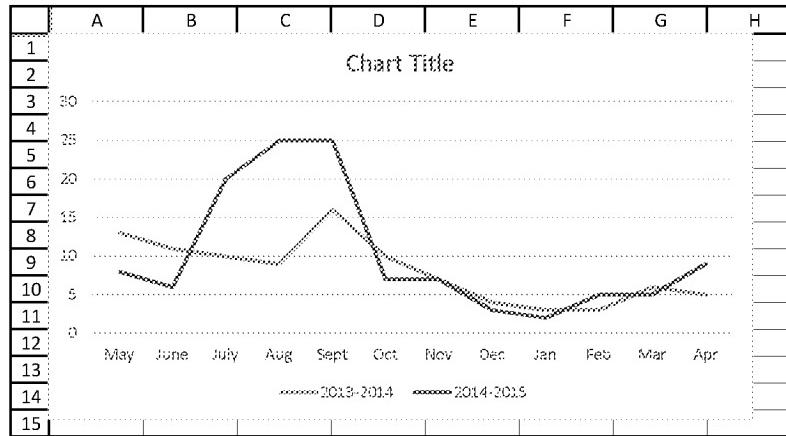
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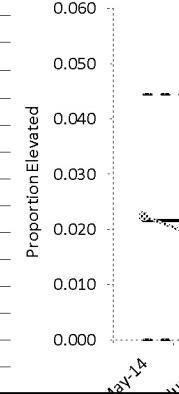
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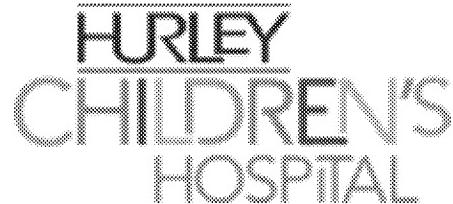


	A	B	C	D	E	F	G	H	I	J
1	Date	Elevated	Tested	Proportion	Mean P	P LCL	P UCL			2013/14
2	May-13	13	380	0.034	0.022	0	0.04		Mean P	0.022
3	Jun-13	11	363	0.030	0.022	0.00	0.04		Mean n	362.08
4	Jul-13	10	385	0.026	0.022	0.00	0.04			
5	Aug-13	9	404	0.022	0.022	0.00	0.04			
6	Sep-13	16	438	0.037	0.022	0.00	0.04			
7	Oct-13	10	427	0.023	0.022	0.00	0.04			
8	Nov-13	7	310	0.023	0.022	0.00	0.04			
9	Dec-13	4	283	0.014	0.022	0.00	0.04			
10	Jan-14	3	313	0.010	0.022	0.00	0.04			
11	Feb-14	3	325	0.009	0.022	0.00	0.04			0.060
12	Mar-14	6	371	0.016	0.022	0.00	0.04			0.050
13	Apr-14	5	346	0.014	0.022	0.00	0.04			0.040
14	May-14	8	356	0.022	0.022	0.00	0.04			0.030
15	Jun-14	6	329	0.018	0.022	0.00	0.04			0.020
16	Jul-14	20	386	0.052	0.022	0.00	0.04			0.010
17	Aug-14	25	452	0.055	0.022	0.00	0.04			0.000
18	Sep-14	25	480	0.052	0.022	0.00	0.04			
19	Oct-14	7	361	0.019	0.022	0.00	0.04			
20	Nov-14	7	283	0.025	0.022	0.00	0.04			
21	Dec-14	3	224	0.013	0.022	0.00	0.04			
22	Jan-15	2	305	0.007	0.022	0.00	0.04			
23	Feb-15	5	287	0.017	0.022	0.00	0.04			
24	Mar-15	5	348	0.014	0.022	0.00	0.04			
25	Apr-15	9	339	0.027	0.022	0.00	0.04			

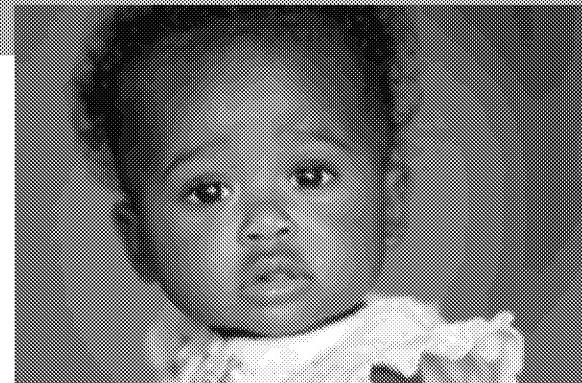


PEDIATRIC LEAD EXPOSURE IN FLINT, MICHIGAN: A FAILURE OF PRIMARY PREVENTION

Mona Hanna-Attisha MD MPH FAAP
Hurley Children's Hospital
Michigan State University Department of
Pediatrics and Human Development



Introducing Makayla*



- 12 month old girl (DOB 8/15/2014) presented last week for her 1 year old check up. No concerns.
- Lives with single mom and 2 older siblings in west side (48504). Formula from WIC; powder mixed with warm tap water.
- Physical exam and development are normal. Makayla receives her 1 year old vaccines and routine lead and hemoglobin screening.
- *A couple days later, lead level comes back as 6 ug/dL.*

*Hypothetical scenario

Blood lead level of 6 ug/dL....

- Blood lead levels (BLL) above 5 ug/dL are considered elevated blood lead levels (EBL)
- Just a few years ago (2012), 10 ug/dL was cutoff
- Increasing evidence shows NO safe blood lead level
- Disproportionately impacts low income, minority children
- Primary prevention is most important

Primary Prevention

- “Because no measurable level of blood lead is known to be without deleterious effects, and because once engendered, the effects appear to be irreversible in the absence of any other interventions, public health, environmental and housing policies should encourage PREVENTION of all exposure to lead.”

“Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention.”
2012 CDC Advisory Committee on Childhood Lead Poisoning Prevention.

What will happen to Makayla?

- Vast evidence supports increased likelihood of:
 - Decrease in IQ
 - An increase in BLL from 1 to 4 ug/dL, drops mean IQ -3.7 points
 - Small change in mean IQ, shifts entire population IQ distribution
 - Reduces high achievers IQs (>130) and increases kids with low IQs (<70)
 - Implications for special education services, employment, incarceration, life achievement, etc

Lanphear BP et al., Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. Environ Health Perspect, 2005. 113:894-9.

Fewtrell LJ, Pruss-Ustun A, Landrigan P, and Ayuso-Mateos JL, Estimating the global burden of disease of mild mental retardation and cardiovascular diseases from environmental lead exposure. Environmental Research, 2004. 94:120-33.

Behavioral Burden

- Increased likelihood of :
 - ADHD behaviors
 - Delinquent behaviors and arrests
 - Total arrests and increased rates of arrests involving violent offenses
 - Other health effects: hematologic, cardiovascular, immunologic, endocrine, etc

Wright, JP, KN Dietrich, MD Ris, et al. 2008. Association of prenatal and childhood blood lead concentrations with criminal arrests in early adulthood. *PLoS Med* 5(5): e101

Chen, A, B Cai, KN Dietrich, et al. 2007. Lead exposure, IQ, and behavior in urban 5-7 year-olds: Does lead affect behavior only by lowering IQ? *Pediatrics* 119(3): e650-e658.

Needleman, HL, C McFarland, RB Ness, et al. 2002. Bone lead levels in adjudicated delinquents: A case control study. *Neurotoxicology and Teratology* 24(6):711-717.

The Cost

- “For childhood lead poisoning, \$5.9 million in medical care costs, as well as an additional \$50.9 billion (sensitivity analysis: \$44.8–\$60.6 billion) in lost economic productivity resulting from reduced cognitive potential from preventable childhood lead exposure.”
- “The present value of Michigan’s economic losses attributable to lead exposure in the 2009 cohort of 5 year-olds ranges from \$3.19 (using U.S. blood lead levels) to \$4.85 billion (using Michigan blood lead levels) per year in loss of future lifetime earnings.”

Leonardo Trasande and Yinghua Liu. Reducing The Staggering Costs Of Environmental Disease In Children, Estimated At \$76.6 Billion In 2008. *Health Affairs*, 30, no.5 (2011):863-870

The Price of Pollution: Cost Estimates of Environment-Related Childhood Diseases in Michigan. 2010 Report by Michigan Network of Children’s Environmental Health

Lead in Water

- Increasing as source of lead, because of success in controlling other sources.
- Increasing due to aging water infrastructures, change in water sources, disinfectant uses, etc
- Disproportionally impacts developmentally-vulnerable formula-fed infants and pregnant mothers
 - For about 25% of infants drinking formula made from tap water at 10 ppb, blood lead would rise above the CDC level of concern of 5 micrograms/deciliter (or ug/dL).
 - Increase in fetal death and reduced birth weights

Triantafyllidou, S., Gallagher, D. and Edwards, M. Assessing risk with increasingly stringent public health goals: the case of water lead and blood lead in children. *Journal of Water and Health*. doi: 10.2166/wh.2013.067 58-68 (2014).

Edwards, M. Fetal Death and Reduced Birth Rates Associated with Exposure to Lead-Contaminated Drinking Water. *Env. Sci. and Tech.* 2013 DOI: 10.1021/es4034952

PRELIMINARY RESULTS

Preliminary Results of Pediatric Blood Lead Levels (BLL)

• Methods

- Data from all blood lead levels processed at Hurley Medical Center
- HMC Institutional Review Board (IRB) approved
- All children 5 years of age and younger
- Zip codes 48501-48507
- Two periods of comparison:
 - PRE-SWITCH: January 1, 2013 – September 15, 2013
 - POST-SWITCH: January 1, 2015 – September 15, 2015
- Analyzed % Elevated Blood Lead (EBL)
 - EBL = Blood lead Levels > 5 g/dL

Blood Lead Level Analysis

- Large sample size
 - N= 1746 for Flint children (pre n=906, post n=840)
 - N= 1670 for non-Flint children (pre n=943, post n=727)

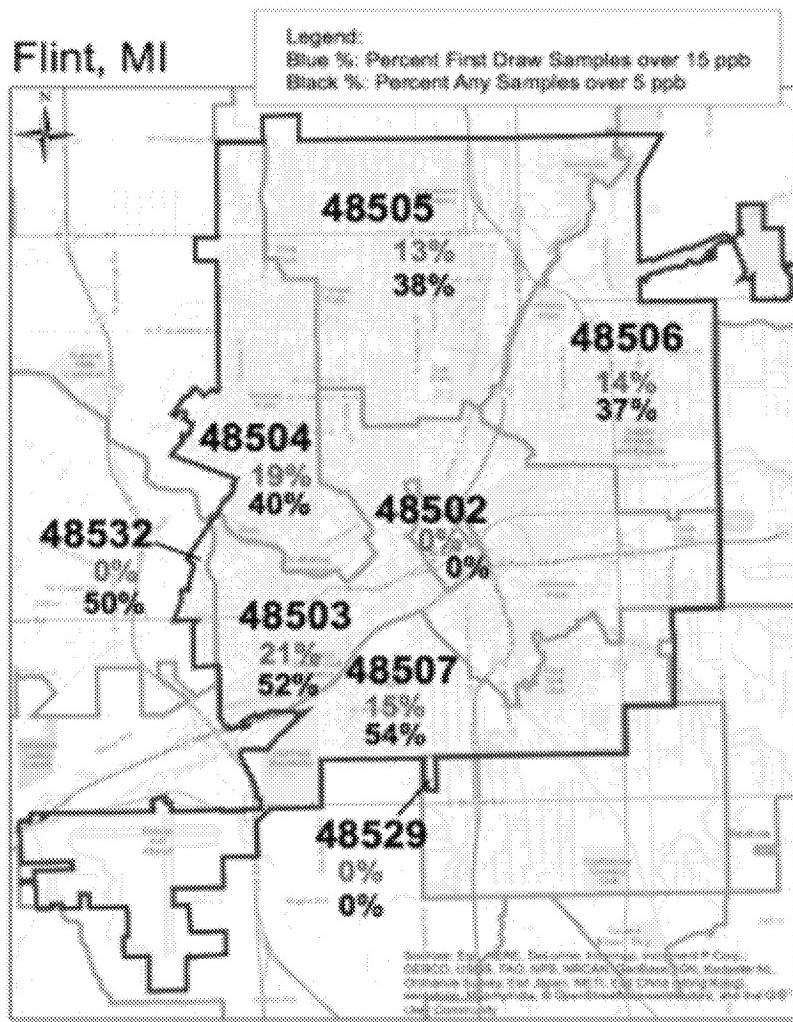
Flint results for children 5 years and under:

PRE-SWITCH % EBL: 2.1% (consistent with MDHHS data 2.2)

POST-SWITCH % EBL: 4.0%

p < 0.05; STATISTICALLY SIGNIFICANT CHANGE

High Risk Zip Codes Results



- Focus on zip codes (48503 and 48504) with high water lead levels
- Total n=742, pre n=394, post n=348
 - Results:
 - PRE-SWITCH % EBL: 2.5%
 - POST-SWITCH % EBL: 6.3%
 - **p < 0.05; STATISTICALLY SIGNIFICANT CHANGE**

What was rest of county doing?

- Analysis of same time periods for Genesee County children who live outside of City of Flint zip codes (non 48501-48507)
 - N=1670 for non-Flint children (pre n=943, post n=727)

Non-Flint results for children 5 years and under:

PRE-SWITCH % EBL: 0.6%

POST-SWITCH % EBL: 1.0%

p = 0.637; NO CHANGE

Blood Lead Level Analysis

- % EBL all children less than 5 years of age

	ALL FLINT (n=1746)	HIGH-RISK FLINT (n=742)	REST OF FLINT (n=1004)	NON-FLINT (n=1670)
PRE-SWITCH	2.1%	2.5%	1.8%	0.6%
POST-SWITCH	4.0%	6.3%	2.4%	1.0%

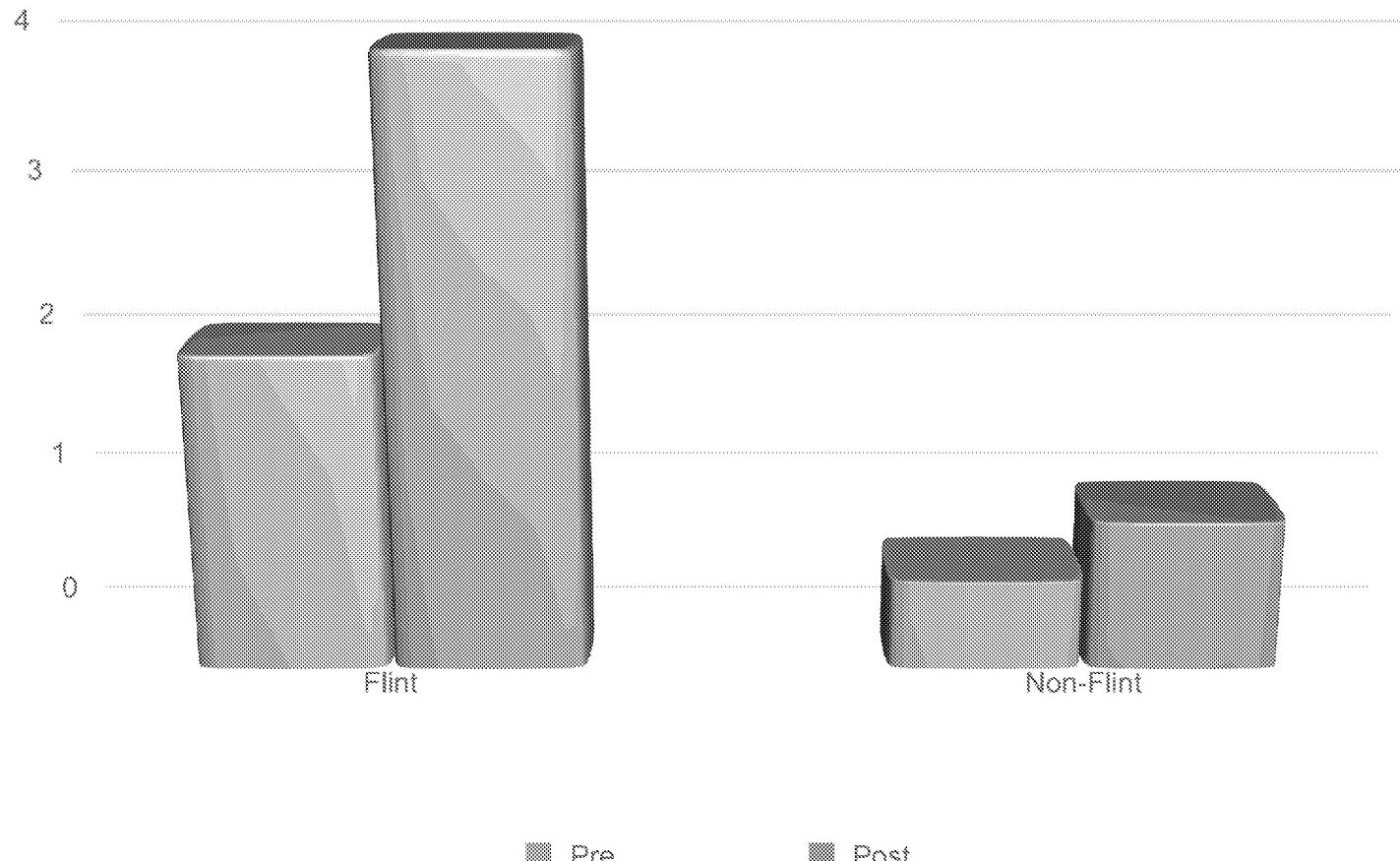
Blood Lead Level Analysis

- % EBL children 15 months or less
 - Total Flint n=619, pre n=295, post n=324
 - Total Non-Flint n=816, pre n=443, post n=376

	HIGH-RISK FLINT (n=269)	REST OF FLINT (n=350)	NON-FLINT (n=816)
PRE-SWITCH	1.5%	0.6%	0.5%
POST-SWITCH	4.4%	1.1%	0.5%

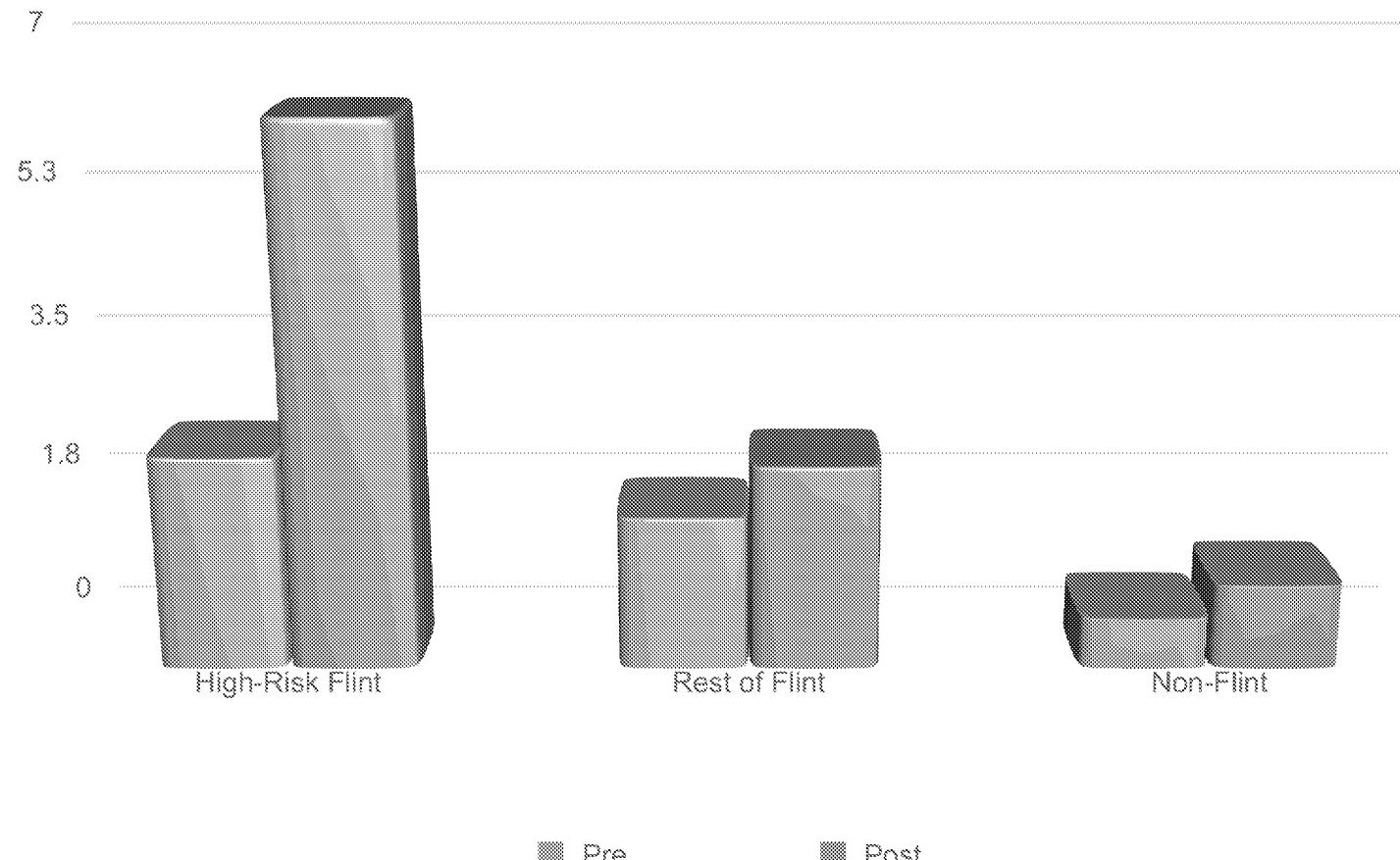
Graphical Summary

Change in % EBL Flint vs Non-Flint



Graphical Summary

Change in % EBL by area



Conclusions from BLL analysis

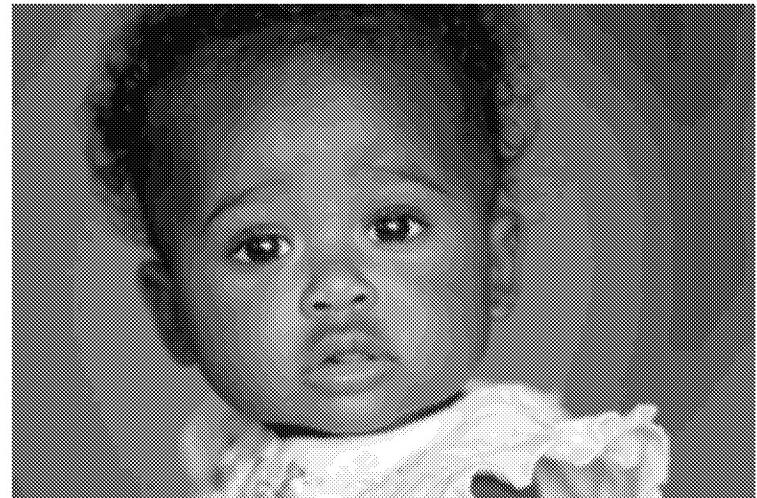
- % of children with EBL in Flint has increased
 - Most striking increase in zip codes with highest water lead levels
- Results underestimate risk: infants not screened for lead and water usage unknown.
 - *Accurate exposure largely unknown since national childhood lead screening focuses on household lead exposure (paint, soil, dust) at later ages (1 and 2 yrs)*
- Results are consistent and concerning. Primary prevention has failed.

Next Steps

- Immediately limit further exposure
 - Encourage breast feeding
 - No tap water for high risk groups: infants on formula & pregnant mothers
 - Declare health advisory: allows WIC to administer water or ready-to-feed formula and other resources (Salvation Army & United Way water supplies)
 - Distribution of lead clearing NSF-approved filters
 - Public education regarding precautions (flushing, etc)
 - Re-connect to Lake Huron water source ASAP

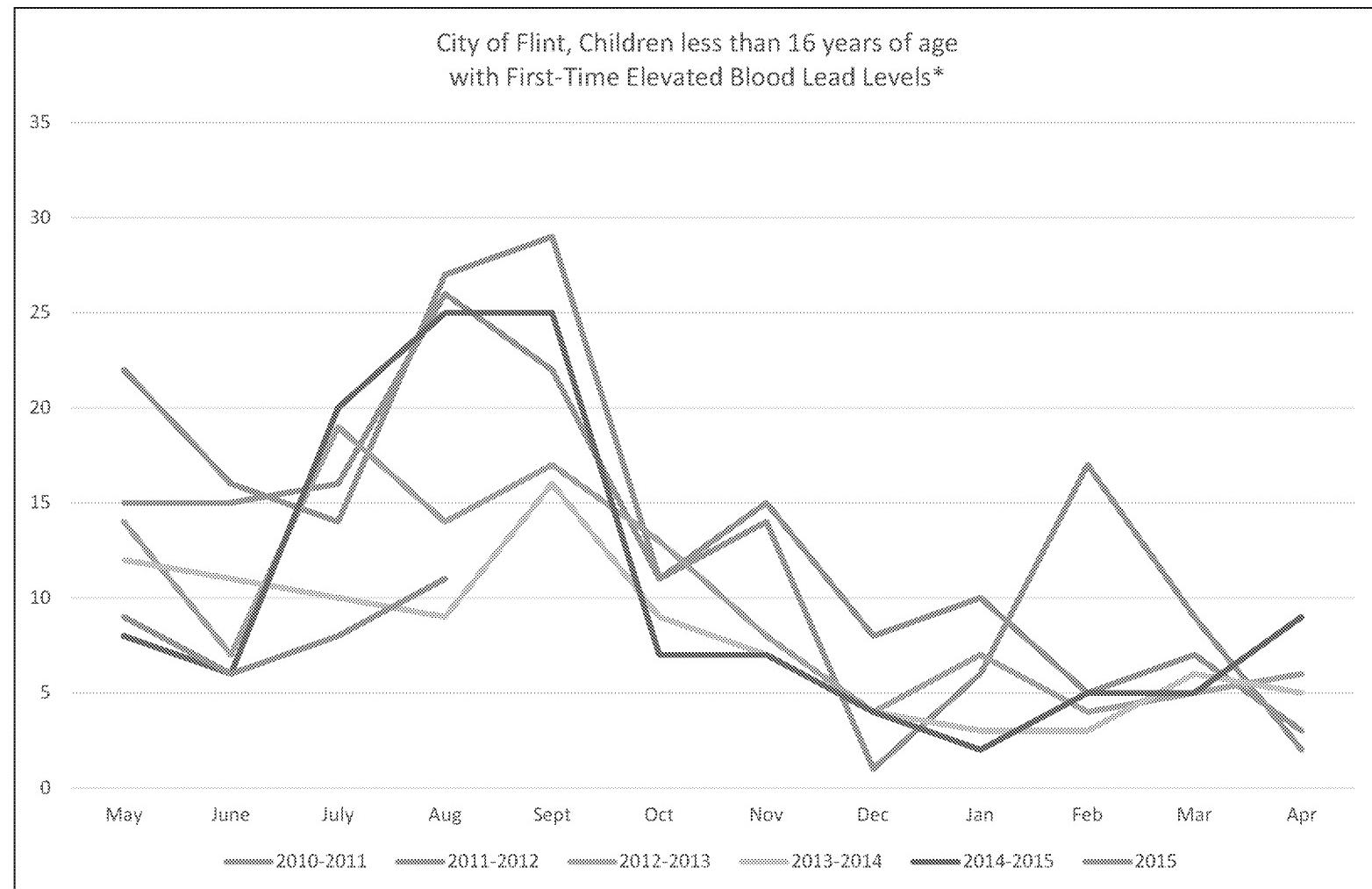
And Makayla...

- Asymptomatic now
- But what will her future hold and an entire generation of Flint children?



Blood Lead Testing of Children in Flint, Before and After the Change in Flint's Water

- The change in Flint's water source occurred in April 2014. MDHHS looked at children's blood lead levels (BLL) before and after this event.
- The dark blue line (May 2014 – April 2015) and the green line (May-August 2015) reflect children's blood lead tests after the change. All other lines reflect tests before the change.
- An increase in childhood lead poisoning in summer (July, August, September) is typical throughout Michigan every year.
- While there is a dramatic difference between the numbers of elevated BLL in the summer before and after the event, a wider look that includes data back to 2010 shows that the year BEFORE the event (the yellow line) was more of an anomaly than the year after (the dark blue line).
- If elevated BLL were being driven by the change in water, we would expect the dark blue line to stay high rather than follow the seasonal pattern.
- All data included in this analysis were reported by laboratories directly to MDHHS, in accordance with State law.



*This graph includes:

Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Children less than 16 years of age at time of test

Only first-time blood lead levels $\geq 5 \text{ ug/dL}$

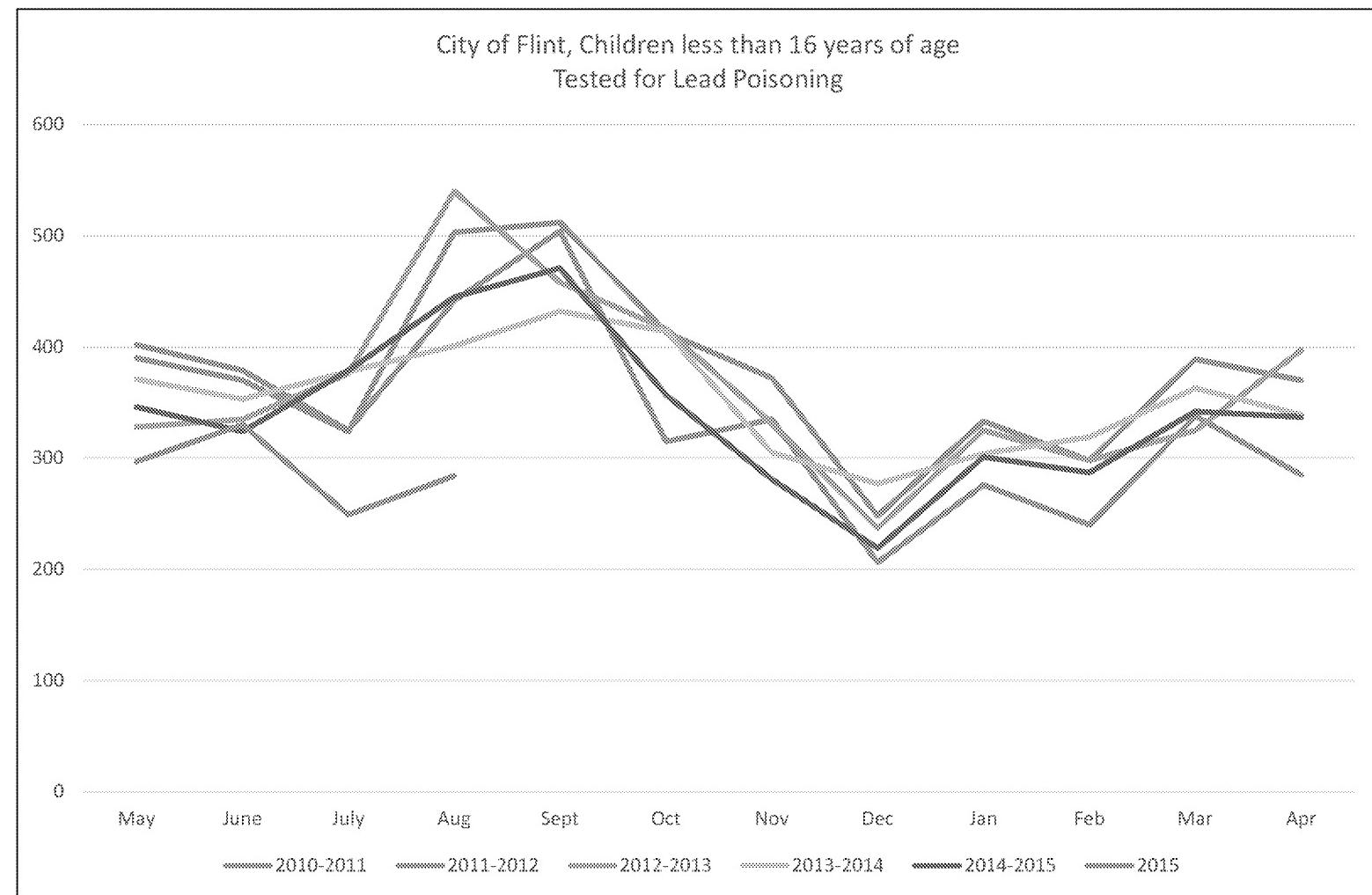
All first-time elevated levels, regardless of sample type (venous, capillary or unknown)

September 24, 2015

Source: MDHHS Data Warehouse,
Lead Specimen table

Blood Lead Testing of Children in Flint, Before and After the Change in Flint's Water

- Blood lead testing (regardless of elevated levels) also tends to rise during late summer (August, September, October).
- This graph shows that testing in Flint has remained fairly steady over the last five years, except for a recent decline (May – August 2015).



*This graph includes:

Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Children less than 16 years of age at time of test

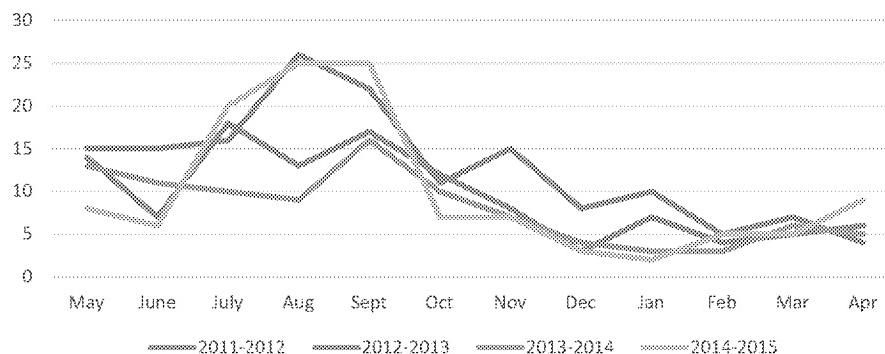
The number of children tested within each month.

Some children are tested more than once, and may be included in more than one month or year.

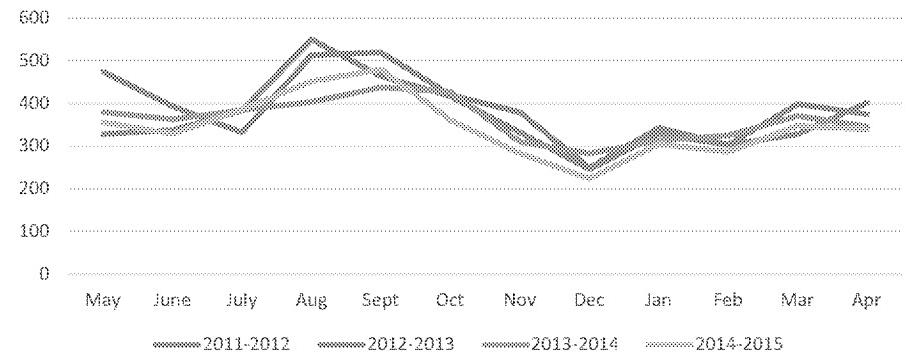
September 24, 2015

Source: MDHHS Data Warehouse,
Lead Specimen table

**City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels**



**City of Flint, Children less than 16 years of age
Tested for Lead Poisoning**



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2011-2012	15	15	16	26	22	11	15	8	10	5	7	4
2012-2013	14	7	18	13	17	12	8	3	7	4	5	6
2013-2014	13	11	10	9	16	10	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	3	2	5	5	9

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2011-2012	474	393	332	513	520	420	379	249	343	303	399	375
2012-2013	328	338	383	550	464	417	332	246	328	303	328	402
2013-2014	380	363	385	404	438	427	310	283	313	325	371	346
2014-2015	356	329	386	452	480	361	283	224	305	287	348	339



Exposure of young children to household water lead in the Montreal area (Canada): The potential influence of winter-to-summer changes in water lead levels on children's blood lead concentration

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ABSTRACT

Drinking water represents a potential source of lead exposure. The purpose of the present study was to estimate the magnitude of winter-to-summer changes in household water lead levels (WLLs), and to predict the impact of these variations on BLLs in young children. A study was conducted from September, 2009 to March, 2010 in 305 homes, with a follow-up survey carried out from June to September 2011 in a subsample of 100 homes randomly selected. The first 1-L sample was drawn after 5 min of flushing, followed by a further 4 consecutive 1-L samples after 30 min of stagnation. Non-linear regression and general linear mixed models were used for modelling seasonal effects on WLL. The batchrun mode of Integrated Exposure Uptake Biokinetic (IEUBK) model was used to predict the impact of changes in WLL on children's blood lead levels (BLLs). The magnitude of winter-to-summer changes in average concentrations of lead corresponded to 6.55 µg/L in homes served by lead service lines (LSSL homes) and merely 0.30 µg/L in homes without lead service lines. For stagnant samples, the value reached 10.55 µg/L in 'LSSL homes' and remained very low (0.36 µg/L) in 'LSSL – homes'. The change in the probability of BLLs ≥ 5 µg/dL due to winter-to-summer changes in WLL was increased from <5% (in winter) to about 20% (in summer) in children aged 0.5–2 years. The likelihood of having BLLs ≥ 5 µg/dL in young children during warm months was reduced by at least 40% by flushing tap-water.

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1. Introduction

Exposure to lead is a public health concern, particularly as it can affect the neurodevelopment of young children. Previous studies suggested that intellectual deficits in children occurred even at relatively low blood lead levels (BLLs) (Lanphear et al., 2005; US NTP, 2011), leading to the revision of the 10 µg/dL threshold set previously by the CDC (U.S. CDC, 2012).

Drinking water represents a potential source of lead exposure for children. From 2000 to 2007, the proportion of elevated BLLs ($\geq 10 \mu\text{g}/\text{dL}$) among children aged ≤ 30 months in Washington, D.C. was strongly correlated to lead in water and the presence of lead service lines (LSLs) (Edwards et al., 2009). Young children living in homes with LSLs are especially at risk of elevated BLLs (Brown et al., 2011). LSLs are still numerous

in North America. Furthermore, because of the shared ownership of the LSLs, they are often only partially replaced and continue to contribute to lead at the tap. Health Canada set a Maximum Acceptable Concentration (MAC) of 10 µg/L and requires for residential sites an annual sampling between May and October (Health Canada, 2009). The sampling protocol applied for the sample collection varies from one province to another: in Ontario, 2 consecutive litres are collected after 30 min of stagnation. In Quebec, the regulation applies to a sample collected after 5 min of flushing but since 2013, 30 min of stagnation samples were added to the protocol for subsequent detailed characterization of the LSL.

The contribution of LSLs to total lead in water is reported to be up to 50–75% (Sandvig et al., 2008). Lead released from LSLs may be produced by both chemical and physical factors. Previous studies showed that lead solubility increases with water temperature (Britton and Richards, 1981; Schock, 1990). However, little is known about the seasonal patterns of household water lead levels (WLLs). In the Montreal area (Canada), Deshommes et al. (2013) reported significant differences in WLL over the year. However, the seasonal results used were mostly not from the same households, and other characteristics unrelated to seasons could explain the variations of WLL observed in the study. There are few follow-up studies assessing seasonal changes in WLL.

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Karalekas et al. (1983) reported variations of WLL across seasons in homes with LSL in Boston. From January 1979 to August 1981, the water temperature varied from 5 °C to 20 °C, and the mean WLL increased from 15–20 µg/L during winter to 36–43 µg/L in summer. de Mora et al. (1987) observed similar results in Glasgow. Both studies reported higher lead in summer, and the higher temperature is a possible cause. The two prior studies suffer from small sample size and did not report longitudinal effects of seasonality on WLL. As a result, the extent of seasonal variations remains unknown.

Finally, seasonal variations of children's BLLs have been reported, BLLs being generally higher in summer as compared to winter (Baghurst et al., 1992; U.S. EPA, 1995; Yiin et al., 2000). In most of the studies, the observed BLL variations were attributed to the fact that children are higher exposed to soil and dust in summer through outdoor exposure. Also, in these studies, the lead concentrations were well characterized in soil and dust, but not or poorly characterized in tap water. Therefore, the contribution of drinking water on seasonal changes in BLLs remains unknown. This study aims to estimate the magnitude of winter-to-summer changes in WLL through separate analyses of homes with and without LSLs in Montreal, and to predict the impact of these variations on BLLs in young children.

2. Materials and methods

2.1. General methodology

A cross-sectional study followed by a follow-up was undertaken in Montreal (Canada) to characterize lead exposure in young children (water, dust, paint). The recruitment process and detailed criteria for selecting homes are fully described elsewhere (Levallois et al., 2014). In the framework of this study, a total of 305 private homes were analysed between September 10, 2009 and March 27, 2010, including 177 with a LSL (LSL+ homes), and 128 without a LSL (LSL− homes), and 7 for which no conclusion could be drawn (Deshommes et al., 2013). Over that period (first campaign), the water temperature varied between 1.4 °C and 21.7 °C (ambient temperature: −15.3 °C to 23.8 °C). Then, a stratified random sampling of 100 homes drawn from the initial sample was selected for a quantification of WLL in summer, including 80 homes with a LSL and 20 without a LSL. A second water sampling was performed from June 22, 2011 to September 06, 2011 (second campaign) in this subset of homes using the same protocol. The water temperature during that second campaign varied between 16.0 °C and 24.1 °C (ambient temperature: 20–28 °C). The whole sample of 305 households was useful to characterize the basic water chemistry of the system under study and to estimate the marginal distribution of WLL. The follow-up analyses were carried out using the subset sample of 100 households with repeated measures of WLL during both campaigns.

2.2. Water sampling and system information

The four neighbourhoods considered in this study were served by 2 water treatment plants drawing from the same water source, and water

physicochemical parameters were relatively stable. Available data in the period of the study are reported in Table 1. pH and alkalinity data of distributed water were available from January 01, 2003 to December 31, 2010 (provided by the utility). It is assumed that these data are representative of tap level data. Indeed, relatively modest pH variations have been previously reported within the distribution system (Cartier et al., 2011), and were not a significant factor affecting lead concentrations, unlike the length of lead pipes and the presence of particles. In every participating household, the following sampling protocol was applied for tap water. First, a 1 L sample was collected after 5 min of flushing (fully flushed) at the kitchen tap. Then a stagnation of 30 min was carried out in the house and 4 consecutive 1 L samples were collected (namely first-, second-, third- and fourth-draw sample). All samples were collected at a 5 to 7 L/min flow rate in pre-acidified bottles, without removing the tap aerator. The water temperature was measured after approximately 3 min during the flushing of 5 min and flow rate was also measured. Finally, for every home visited, information was collected on the neighbourhood, type of residence, construction year, total number of people living in the home, and the floor level where the sampled tap was located.

2.3. Lead analyses

During the first campaign, the samples acidified at pH < 2 were kept at 4 °C until ICP-MS analysis. Total lead was analysed according to the US EPA method 200.8, but using a 24-hour digestion time for the sample instead of 16 h. This digestion method was tested and compared successfully to stronger digestion methods for the estimation of total and dissolved lead in water samples collected after short stagnation in homes with a LSL in Montreal (Cartier et al., 2011). The lead analyses and QA/QC procedures are summarized in the Supplemental material, Table S1.

For the second campaign, total lead analyses were carried out using a very similar method to the previously described modified US EPA method, including a digestion period of 24-h. The detection and quantification limits were also comparable.

2.4. Variables under study

The response variable was the water lead concentration. Fully flushed and first-draw 1 L samples were considered separately. In addition, a 30MS2-4 variable was created, which refers to the arithmetic mean of the second, third and fourth-draw samples. This stratified modelling was motivated by the fact that a fully flushed sample can provide the home's signature (LSL and plumbing system combined), and the first-draw one provides the specific household tap signature, while the change profiles of lead concentration from the second to the fourth-draw sample differ markedly according to the presence or absence of LSL (Supplemental material, Fig. S1).

For longitudinal analyses, the selected independent variables included flow rate (litre/s), interval time between two measurements, neighbourhood, type of residence, construction year, total number of people living in the home, and tap level (floor level where the tap was

Table 1
Median values (25th percentile–75th percentile) for water physicochemical parameters observed for different seasons.

	LSL− homes ^a			LSL+ homes ^b		
	Autumn	Winter	Summer	Autumn	Winter	Summer
n	38	70	20	32	65	80
WT ^c	12.3 (10.5–15.6)	3.4 (2.6–4.4)	21.0 (19.9–22.9)	12.7 (10.1–14.7)	3.1 (2.4–4.3)	22.4 (21.3–23.4)
pH	8.2 (8.1–8.3)	8.1 (8.1–8.2)	8.2 (8.1–8.3)	8.2 (8.2–8.3)	8.2 (8.1–8.2)	8.2 (8.1–8.2)
Alkalinity	89 (87–89)	89 (88–90)	89 (88–90)	89 (88–89)	89 (88–89)	89 (88–90)

Alkalinity is expressed in mg/L CaCO₃.

^a LSL− homes refer to homes without lead service lines.

^b LSL+ homes refer to homes with a high probability of lead service lines.

^c WT refers to water temperature after 3 min of flushing (°C).

located). Tap level was used as an ordinal variable (0 = basement, 1 = first-floor, 2 = second-floor, 3 = third floor). The neighbourhood was used as a nominal variable. The construction year was coded 1 for homes built before 1950 and 0 otherwise. The choice of this cut-off was motivated by the fact that we had very little residence built after 1975 ($n = 21$). Dichotomization to 1950 was the only categorization ensuring a parsimonious regression model because it allowed having enough residences in each stratum to the regression. The 'type of residence' was stratified before analysis into two categories: 1 = single-houses ($n = 24$) and 2 = others (row-houses ($n = 71$) and multi-level houses ($n = 5$) were combined in this category). The total number of people living in the home was used as an ordinal variable. The period from September 10 to December 15 was defined as "fall", based on water temperature cut-off below 10 °C. 'Winter' was from December 16 to March 27 and 'summer' from June 22 to September 06. Before analyses, two additional dichotomous variables were created: the variable 'TIME' referred to the lead concentration observed in different campaigns (1 = WLL observed in the second campaign (summer), 0 = WLL observed in the first campaign (fall or winter)), and the variable 'REFERENCE PERIOD' referred to the period of first sampling (homes whose first sampling was from September 10 to December 15 were coded as 0 and those with a first sampling from December 16 to March 27 were coded as 1). In the absence of data on water usage, the 'type of residence' and the 'number of persons living at home' were included into the regression models in order to control the influence of water usage on seasonal changes in WLL.

2.5. Statistical analysis

The Kruskal–Wallis test was used to compare mean WLL across seasons, and the Shapiro–Wilk test to assess Gaussian distribution of outcome variables. When the assumption of normality was rejected, a log transformation was then undertaken. Analyses of covariance (ANCOVA) were used to obtain geometric means of WLL and to test the differences across dwelling types (or number of residents).

The influence of seasonality on household WLL was assessed using two approaches. The first approach was based on the cross-sectional sample ($n = 305$). In the case of the 100 homes for which a follow-up analysis was carried out, only summer data were considered in this analysis, leading to 70 fall data, 135 winter data, and 100 summer data. The variation of WLL throughout the year was modelled using a parametric sine function. This approach was very useful to estimate the daily changes in marginal mean of WLL throughout the year, as predicted by the model. It was assumed that temporal fluctuation in WLL could be well described by the following function: $WLL = A * \sin [(2\pi / 365.2) * (Days - B)] + C$. The variable 'Days' was numbered from 0 to 360 with the null value assigned to the first day of recruitment (September 10, 2009). The non-linear regression of the sine function was used to estimate the parameters (A, B and C). 'A' represents half of the difference between the highest and lowest WLL values. 'B' is the horizontal shift reflecting changes in the 'Days' variable. It is determined by calculating how many days the starting point of a standard sine curve has moved to the right (positive value) or left (negative value). Parameter 'C' gives the vertical shift, by showing how many units the modelled function is moved up (or down). Smoothing analyses (non-parametric) were also performed using GAM and TRANSREG procedures. For assessing the adequacy of fit of models, results from the parametric and non-parametric modelling were compared by using mean absolute percentage error (MAPE). The pseudo-R² was also reported.

The second approach was conducted as a longitudinal analysis on the subset sample with a follow-up measure of WLL during summer ($n = 100$). For this analysis, each home had two values of WLL: a first value (baseline) from the first campaign (fall or winter, depending on the date of the first visit) and a second value from the second campaign (summer). The magnitude of seasonal changes in WLL, as well as the temporal change profile of the 4-L samples collected after stagnation, was

estimated by using the general linear mixed model with REPEATED statement. The mixed model was preferred over the ordinary least squares model since the latter fails to control for random effects and has limitations for assessing regression estimates from longitudinal data (Ugrinowitsch et al., 2004). For all the follow-up analyses, the restricted maximum likelihood method was used to choose the appropriate variance/covariance matrix. The beta coefficient obtained for the variable 'TIME' indicated the marginal difference in WLL between the first and the second campaign when REFERENCE PERIOD is equal to zero (i.e. in homes sampled during 'fall'). On the other hand, the beta coefficient obtained for the variable 'REFERENCE PERIOD' indicated the marginal difference in WLL between 'fall' and 'winter', when TIME is equal to zero (i.e. during the first campaign). All analyses were performed using SAS software (version 9.3 SAS Institute Inc., Cary, NC). For estimating the effect of seasonality on WLL, separate analyses for fully flushed, first-draw, and 30MS2-4 were carried out. As part of each analysis, a separate stratified analysis was conducted for LSL+ homes and LSL− homes.

2.6. IEUBK modelling

The modelled WLL was applied in the Integrated Exposure Uptake Biokinetic model (IEUBK win1_1 Build11) in order to predict the seasonal changes of BLL. The IEUBK model allows estimating the predicted mean of BLLs at each point, as well as the expected percentage of exposed children's population exceeding the BLL threshold of 5 µg/dL. Background values of exposure to lead from soil, dust, air, and diet were set according to Deshommes et al. (2013). These values were validated as reflecting well the background exposure in Montreal young children background exposure. The batchrun mode of IEUBK was used according to Deshommes et al. (2013). The WLL entered in the batchrun mode was changed every week of the children life from 0 to 84 months of age, according to the WLL model predictions. Finally, children drinking tap water were considered for the modelling, therefore 0.741–1.0 L/d water intakes were considered as detailed in Deshommes et al. (2013). Based on the previous study reporting the marked influence of the type of residence on the lead concentration in tap-water, and given the small number of single-houses in our dataset, we performed IEUBK on both the whole sample ($n = 305$) and the subset sample without single-houses ($n = 240$).

3. Results and discussion

3.1. Characteristics of homes sampled

Several factors have been shown to influence WLL, the type of residence being overwhelming. In the presence of a LSL, higher WLL is generally measured in single-family homes compared to other dwelling types (Deshommes et al., 2013). Such differences are explained by the fact that the LSL is shared between several families in the case of multiple dwelling types (duplex, triplex, etc.) as compared to single-family homes. In terms of exposure, the higher number of users lowers the probability to be exposed to high WLL after stagnation. In addition, the configuration, length, and volume of premise plumbing and LSL are more variable than in single-family homes.

The characteristics of the pools of households monitored in this study are shown in the supplemental material, Table S2. The homes under study were mostly row-homes (66.9%), including paired-duplexes, paired-triples, and townhouses. Also, single-family homes with a LSL were few represented as only 30 were sampled during the first campaign and 24 of them during the second campaign. Therefore, the type of residence sampled was quite uniform and consisted mostly of multiple family dwellings. In addition, the households not sampled in the second campaign did not differ from the 100 households sampled in the second campaign for the other parameters studied except temperature. Indeed, as shown in the Supplemental material, Table S3,

except for the neighbourhood, the distribution of other fixed variables (e.g., flow-rate, type of residence, floor where tap was located, total number of residents) did not markedly differ when homes sampled in the second campaign were compared with those with no repeated data.

3.2. Water lead concentrations

From September 10 (2009) to March 27 (2010), the geometric mean of WLL after 5 min of flushing was 0.22 µg/L (95% CI: 0.06–0.78) in LSL—homes versus 2.19 µg/L (95% CI: 0.55–8.81) in LSL+ homes. During the summer months (from June 22 (2011) to September 06 (2011)), flushed samples showed a geometric mean of 0.26 µg/L (95% CI: 0.11–0.63) in LSL—homes and 3.03 µg/L (95% CI: 1.06–8.69) in LSL+ homes. The distribution of lead concentration in stagnant samples is fully described in Table 2.

The unadjusted comparison of WLL in different samples showed a significant difference in median WLL across seasons, regardless of the presence/absence of LSLs (Supplemental material, Table S4). Summer data indicated that average lead concentration from the first and second-draw samples exceeded the Health Canada's MAC in 45.5% of LSL+ homes (versus 0.0% in LSL—homes) (data not shown). In addition, the lead concentration after 5 min of flushing remained ≥10 µg/L in 28.6% of LSL+ homes. Therefore, these differences highlight the importance of further study of BLLs in link with WLLs. The wide seasonal variations of lead concentrations highlight the need for predicting the seasonal exposure through tap water, especially during summer and early fall corresponding to higher water temperature and maximum lead dissolution. Moreover, the wider differences between lead concentrations measured by different sampling protocols in warm water suggest that the selection of sampling protocol may be critical to the evaluation of the exposure through tap water during peak exposure periods. Therefore a predictive seasonal model was developed and the impact of sampling protocol on the exposure and resulting BLL was investigated.

3.3. Influence of seasonality on household water lead levels

3.3.1. Results from cross-sectional data

The seasonal patterns of changes in fully flushed and composite stagnant samples (average concentration of the four samples collected after 30 min of stagnation) are shown in Fig. 1 for both LSL—homes ($n = 128$) and LSL+ homes ($n = 177$). The estimated coefficients corresponding to the sine non-linear regression (and describing the predicted values of WLL over the year) are presented in the Supplemental

material, Table S5. Water lead concentrations vary substantially according to temperature in LSL+ houses and to a much lesser extent in LSL—houses. The nonlinear regression model shows average concentrations after 5 min of flushing ranging from 1.67 to 8.22 µg/L in LSL+ homes (Fig. 1b). The magnitude of winter-to-summer changes in average concentrations corresponded to 6.55 µg/L in LSL+ homes and merely 0.30 µg/L in LSL—homes. Predicted values from smoothed curves and non-linear regression are fairly similar with excellent MAPEs (0.09 for LSL+ homes, 0.18 for LSL—homes). The MAPE value of 0.09 indicates that the predicted water lead concentration from our model would be similar to the one obtained from the smoothed curve, in 91% of cases. Therefore, the average changes in water lead in LSL+ homes can be well-predicted from our model. For the composite sample, predicted largest average lead concentrations in summer reached 1.10 µg/L in LSL—homes (Supplemental material, Fig. S2a) and 14.32 µg/L in LSL+ (Supplemental material, Fig. S2b). The magnitude of average changes in water lead concentrations from winter to summer reached 10.55 µg/L in 'LSL+ homes' and remained very low (0.36 µg/L) in 'LSL—homes'. MAPEs comparing smooth and sine functions were 0.13 and 0.14 for 'LSL+ homes' and 'LSL—homes', respectively. It has previously been shown that single-houses impacted lead concentration in drinking water (Deshommes et al., 2013). In the presence of LSL, higher WLL is generally measured in single-family homes (compared with row- or multi-level homes). This is mainly due to (1) the configuration of the service lines and; (2) the consumption patterns of water usage since the service line only serves a single household. In single-homes, it is relatively simple to control water usage and apply reference stagnation. Because of the presence of multiple households on a single service line, sampling with controlled stagnation is only possible if all residents restrain from any water use, which is difficult to verify. Therefore stagnation in samples in multiple family dwelling may vary from 0 to 30 min. In terms of exposure, this translates for the residents as there is lower probability to be exposed to high WLL. We noted that our sample included a very small number of single-homes, which make it difficult to obtain a valid statistical analysis in this subset of homes. Because of these important features, we performed the same analyses after excluding the subset of single-homes from the dataset (sensitivity analyses). Fig. 1c and d and the related non-linear regression show that the regression coefficients remain largely unchanged but the model fit is improved significantly (Supplemental material, Table S6). Similar figures for stagnant samples are shown in Supplemental materials, Fig. S2c and S2d. It is likely that the true seasonal changes in WLL are more important in single-homes. The fact that these houses represent a low proportion of our sample (<21%) may explain the lack of change

Table 2
Percentiles and geometric mean (GM) for lead concentration in different water samples in µg/L during the first and the second campaigns.

	First campaign ^a (n = 305)						Second campaign ^b (n = 100)					
	p10	p25	p50	p75	p90	GM (95% CI)	p10	p25	p50	p75	p90	GM (95% CI)
<i>LSL—homes^c</i>												
5MF ^d	0.10	0.16	0.22	0.32	0.51	0.22 (0.06–0.78)	0.14	0.18	0.28	0.34	0.42	0.26 (0.11–0.63)
30MS1 ^e	0.28	0.44	0.70	1.22	1.51	0.71 (0.16–3.19)	0.27	0.43	0.64	0.98	1.32	0.64 (0.21–1.95)
30MS2	0.21	0.31	0.55	0.80	1.19	0.50 (0.12–2.05)	0.21	0.27	0.46	0.77	1.06	0.47 (0.14–1.56)
30MS3	0.16	0.24	0.40	0.59	1.02	0.40 (0.10–1.60)	0.20	0.26	0.39	0.66	0.81	0.41 (0.15–1.60)
30MS4	0.14	0.25	0.36	0.51	0.94	0.37 (0.09–0.47)	0.21	0.27	0.35	0.56	0.78	0.39 (0.13–1.16)
<i>LSL+ homes^f</i>												
5MF	1.00	1.46	2.19	3.12	5.33	2.19 (0.55–8.81)	1.58	2.09	2.90	4.16	5.95	3.03 (1.06–8.69)
30MS1	1.83	2.61	3.42	5.37	7.05	3.60 (1.07–12.12)	2.69	3.49	4.73	7.13	8.63	4.86 (1.87–12.64)
30MS2	1.64	2.57	3.17	5.35	7.98	3.53 (0.93–13.45)	2.55	3.56	4.28	7.07	10.35	4.78 (1.68–13.65)
30MS3	1.74	2.44	3.64	5.96	8.31	3.77 (0.85–16.67)	2.48	3.14	4.48	7.45	11.41	5.01 (1.44–17.39)
30MS4	1.30	2.25	3.29	6.89	13.98	3.83 (0.67–22.07)	2.34	3.18	5.01	8.95	15.57	5.51 (1.38–22.01)

^a Refers to home samplings from September 10, 2009 to March 27, 2010.

^b Refers to home samplings from June 22, 2011 to September 06, 2011.

^c LSL—homes refers to homes without lead service lines.

^d 5MF refers to the flushed sample.

^e 30MS_j refers to ^jème sample collected after a stagnation time of 30 min.

^f LSL+ homes refer to homes with a high probability of lead service lines.

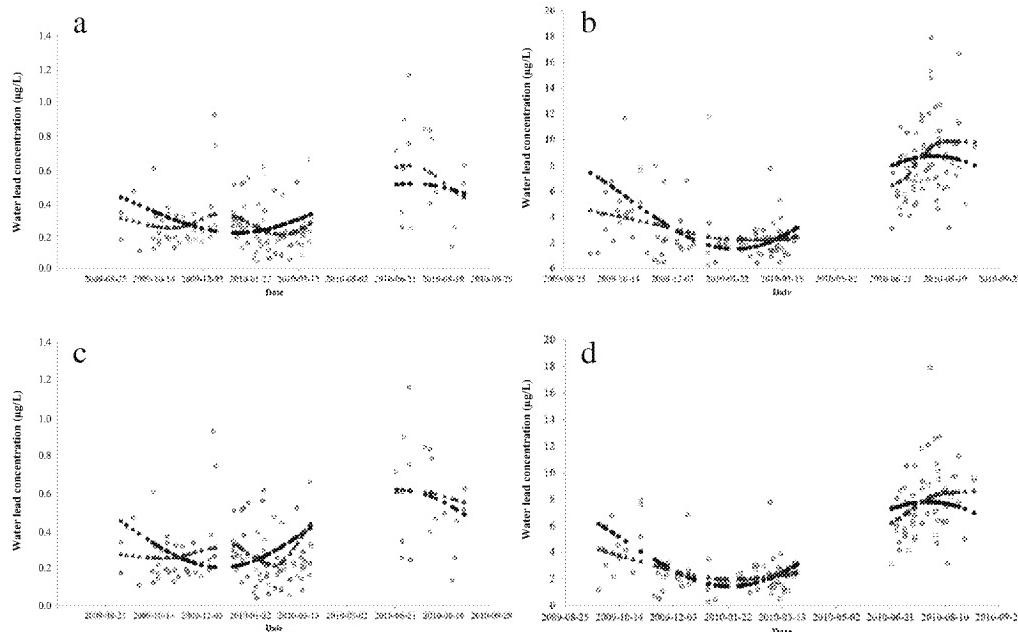


Fig. 1. Temporal variations in water lead concentrations in the flushed sample in homes without (left) and with lead service lines (right), based on the whole sample (above) and after excluding single-houses (below). Observed values (blue circles), smooth curve (red triangle) and predicted values from non-linear regression (black dot).

in regression coefficient in the sensitivity analysis. According to the 2001 Census data, compared with row-houses and apartment buildings, single-homes are a low fraction of total residences in Canada's metropolitan areas, including Montreal (<33%) (Statistics Canada, 2008). Therefore, the distribution of 'type of residence' in our sample is representative of homes in Montreal.

3.3.2. Repeated sampling results

The cross-sectional part allows the estimation of the predictive values of WLL as expected day after day. We could then deduce mean differences in WLL between minimum 'fall/winter' and maximum summer concentrations. However, the characteristics of the households used for transversal sampling conducted during fall, winter and summer may influence the results or trends observed. Indeed, homes included at different seasons may differ in some characteristics unrelated to seasons and which could markedly influence the WLL. In this case, the effect of seasonality may be biased. The follow-up analyses were useful to validate the previous model.

Results from the mixed linear regression are presented in Table 3. The cross-sectional effect at baseline (which represents the mean difference in WLL between 'fall' and 'winter') was very small in LSL- homes. The value of the regression estimate was 0.04 µg/L for the flushed sample ($p = 0.63$). Over the warm months, flushed sample showed a mean increase of 3.60 µg/L ($p < 0.01$) and 0.36 µg/L ($p < 0.01$) in LSL+ and LSL- homes, respectively.

In LSL+ homes, the magnitude of the summer effect on the flushed sample was more marked in homes previously sampled in 'winter'. They showed a discernible additional increase of 2.35 µg/L ($p < 0.01$) in the mean of lead concentrations when compared with homes first sampled in the 'fall' and after adjusting for flow rate, the interval time between two measurements, neighbourhood, construction year, type of residence, the total number of people living in the home, and the floor level where the tap was located. The total increase from winter to summer was then 5.95 µg/L. This winter-to-summer change is very similar to results obtained from the cross-sectional study. Obtaining the same results from both the cross-sectional and follow-up study

designs increases the likelihood that these findings are valid, and confirms the adequacy of our non-linear regression. This similarity also suggests that there was no strong selection bias operating in our cross-sectional data. The observed summer effect represents an increase of approximately 150%, given that the mean 5MF observed in LSL+ homes during the winter months was 2.40 µg/L. Some authors argued that lead concentration in the 1 L sample drawn after 5 min of flushing is primarily influenced by the length and the diameter of the LSL (Cartier et al., 2011). However, these parameters are not varying seasonally and the results obtained in our follow-up study support that seasonal-dependent factors play an important role independent of length or diameter of pipes. Given the follow-up design of our study, we believe that the observed lead concentration changes can be mainly attributed to the change in water temperature.

In LSL- homes, the increase of lead concentration in summer in the flushed sample was very low but statistically significant ($\beta = 0.36 \mu\text{g/L}$; $p < 0.01$). In addition, the pattern of changes from baseline (fall or winter) to summer was similar when comparing homes first sampled in the 'fall' and those with first sampled in the 'winter', irrespective of the sample considered. Moreover, the cross-sectional effect at baseline was very small. The slight increase we observed may be due to lead released from solders. Although the use of LSLs for drinking water systems was prohibited in 1975 under the National Plumbing Code of Canada (NPCC), it should be noted that lead solder was allowed to be used in household plumbing until 1986 under the NPCC (Health Canada, 2009).

The summer mean increase of lead in the first-draw samples was observed in both LSL- ($\beta = 0.49 \mu\text{g/L}$, $p < 0.01$) and LSL+ homes ($\beta = 3.28 \mu\text{g/L}$, $p < 0.01$). However, the increase observed in LSL- homes was very low. Moreover, compared with the fall-to-summer change, the winter-to-summer change was more important only in the LSL+ homes. Homes previously sampled over the winter showed an additional increase of 2.52 µg/L ($p < 0.01$), when compared with those previously sampled in the fall. Assuming an absence of contamination at the water source, the changes in WLL may indicate potential contribution of tap itself or lead-based materials contained in the portion of plumbing (fittings, valves, components) close to the tap. The marginal summer

Table 3

Adjusted^a summer effect on water lead concentration (in µg/L) in the follow-up study (n = 100).

	'LSL-' homes ^b (n = 20)			'LSL+' homes ^c (n = 80)		
	Estimate	Standard error	p-Value	Estimate	Standard error	p-Value
<i>5M^d</i>						
Intercept	0.22	0.13	0.1156	8.64	1.51	<0.0001
Time ^e	0.36	0.06	<0.0001	3.60	0.48	<0.0001
Reference period ^f	0.04	0.08	0.6300	-0.76	0.68	0.2624
Reference period * time	-0.11	0.10	0.2803	2.35	0.59	0.0002
R-square	76.84%			71.16%		
<i>30MS1</i>						
Intercept	-0.25	0.89	0.7818	5.09	2.84	0.0773
Time	0.49	0.13	0.0017	3.28	0.70	<0.0001
Reference period	0.15	0.36	0.6978	-1.17	1.19	0.3267
Reference period * time	-0.26	0.17	0.1543	2.52	0.85	0.0042
R-square	48.20%			51.68%		
<i>30MS2-4^g</i>						
Intercept	0.03	0.49	0.9491	12.73	3.58	0.0007
Time	0.45	0.12	0.0017	3.21	0.77	<0.0001
Reference period	0.15	0.18	0.4129	-1.09	1.60	0.4966
Reference period * time	-0.10	0.17	0.5510	4.21	0.94	<0.0001
R-square	54.96%			49.17%		

^a Adjusted for flow rate, interval time between two measurements, neighbourhood, type of residence, construction year, total number of people living in home, and floor where tap was located.

^b Refers to homes without lead service lines.

^c Refers to homes with a high probability of lead service lines.

^d Refers to the first 1-L sample collected after 5 min of flushing.

^e This variable was coded as 0 and 1 for water lead concentration observed in the first and second campaigns respectively.

^f This variable refers to the period of first sampling: homes whose first sampling was from September 10 to December 15 were coded as 0 and those with a first sampling from December 16 to March 27 were coded as 1.

^g Refers to the arithmetic mean from the second, third and fourth 1-L samples collected after a stagnation time of 30 min.

effect on lead concentration in the first-draw samples was statistically significant ($\beta = 3.28 \mu\text{g/L}$; $p < 0.01$), thereby suggesting the contribution of premise plumbing sources (faucet and interior plumbing) on seasonal changes in WLL. A previous study reported that premise plumbing can contribute 20–35% of the total lead measured at tap (Sandvig et al., 2008). Older homes are more likely to have LSLs, but also leaded solder and other lead bearing materials. The increase in water temperature and the higher water consumption observed during warm months are associated with an increase in lead released from the LSLs, the faucet, the leaded solder and other lead bearing materials. It is more likely that the increase of lead concentration in the first-draw samples probably reflects the direct contribution of premise plumbing and/or LSL.

3.4. Water temperature and lead concentration in flushed sample

We observed a positive linear relation between baseline-to-summer change in lead concentration in flushed sample and baseline-to-summer change in water temperature (Supplemental material, Fig. S3). Our model suggests that 34% of changes observed in lead concentrations are explained by changes in water temperature. We expect an increase of 0.25 µg/L in lead concentration for each increase of 1 °C in water temperature. In a previous study conducted in Montreal (Canada), Cartier et al. (2011) reported similar association between water temperature and lead concentration in flushed sample.

We also observed that water temperature at household level was highly correlated with the water temperature at treatment plant (Supplemental material, Fig. S4). The latter is then a good approximation of the water temperature as observed at tap-level after 3 min of flushing, with a slight bias of 2.64 °C. Detailed investigation on a subset of 34 houses included in the study showed that the total volume in the premise plumbing varied from 2.7 to 9.9 L (outlier of 23 L) with an average of 6.3 L. In all cases, a 3 minute flush prior to measuring temperature was sufficient to measure the temperature of water entering the service line or in the service line.

3.5. Impact of seasonal changes in water lead levels on blood lead levels of young children: results from IEUBK model

In May 2012, the BLL of concern (i.e. 10 µg/dL) has been revised, and the Advisory Committee on Childhood Lead Poisoning Prevention established the 'reference value', currently 5 µg/dL (U.S. CDC, 2012), to identify U.S. children needing more clinical attention and public health follow-up. The estimated BLLs following IEUBK model runs are shown in Fig. 2. The seasonal change in BLLs is evident from our results. If the stagnant water is routinely consumed (we herein considered the mean of four 1 L-samples collected after 30 min of stagnation), the resulting mean BLLs predicted during the summer months (June, July and August) are 3.4 µg/dL in children aged 0.5–1 year and decrease with increasing child's age (2.4 µg/dL for those aged 6–7 years). The magnitude of change in BLLs (i.e. difference between the summer peak and the lowest value) did not strictly differ with child's age, regardless of the exposure scenario (from 0.88 µg/dL in children aged 6–7 years to 1.02 µg/dL in those aged below 1 year). However, the general trend was towards a decrease of both maximum and minimum BLLs with age. Given that all other external sources of lead were kept stable across seasons, the observed changes in BLLs are mainly attributable to changes in WLL.

Although the magnitude of change appears to be independent of child's age, the change in the percentage of children with BLLs $\geq 5 \mu\text{g}/\text{dL}$ from colder to warmer months was largest in children aged below 2 years, and progressively declines with increasing child's age (Fig. 3). Not surprisingly, the 'best' scenario (lowest exposure) was observed by assuming that children consumed flushed water exclusively. The consumption of stagnant water represented the worst exposure scenario. By assuming that children aged below 2 years routinely consume stagnant water, at least 20% of children aged 0.5–2 years were predicted to develop BLLs $\geq 5 \mu\text{g}/\text{dL}$ during warm months (the value was 12% by assuming that children consume exclusively flushed water). This result suggests that, by flushing the water for at least 5 min before consumption, we can reduce by about 40% (from 1/5 to 1/8) the proportion of young children with BLLs exceeding the threshold of 5 µg/dL during summer (assuming that all other sources of lead exposure are kept constant across seasons). The difference between the best and the worst scenario was attenuated with age, suggesting that flushing habits would be more effective to prevent elevated BLLs in younger children. In an intervention study examining the effect of flushing, Fertmann and co-workers showed that flushing water before consumption and using bottled water could lower the BLLs in young women by about 0.82 µg/dL and 1.23 µg/dL, respectively (Fertmann et al., 2004). This corresponded to a reduction of 21% and 37% of the initial BLLs, respectively. However, their study included young women rather than children, and the duration of flushing was not determined. We are unaware of previous studies reporting the impact of changes in household WLL on BLLs using IEUBK model (except for study from Deshommes et al., 2013). A recent study suggests that the percentage of students predicted to exceed BLLs of 5 µg/dL could drop from 11.2% to 4.8% due to remediation by flushing at school level (Triantafyllidou et al., 2014). This corresponds to a reduction of 42.9% in the proportion of student with BLLs $\geq 5 \mu\text{g}/\text{dL}$, which is fairly similar to the reduction computed in this study.

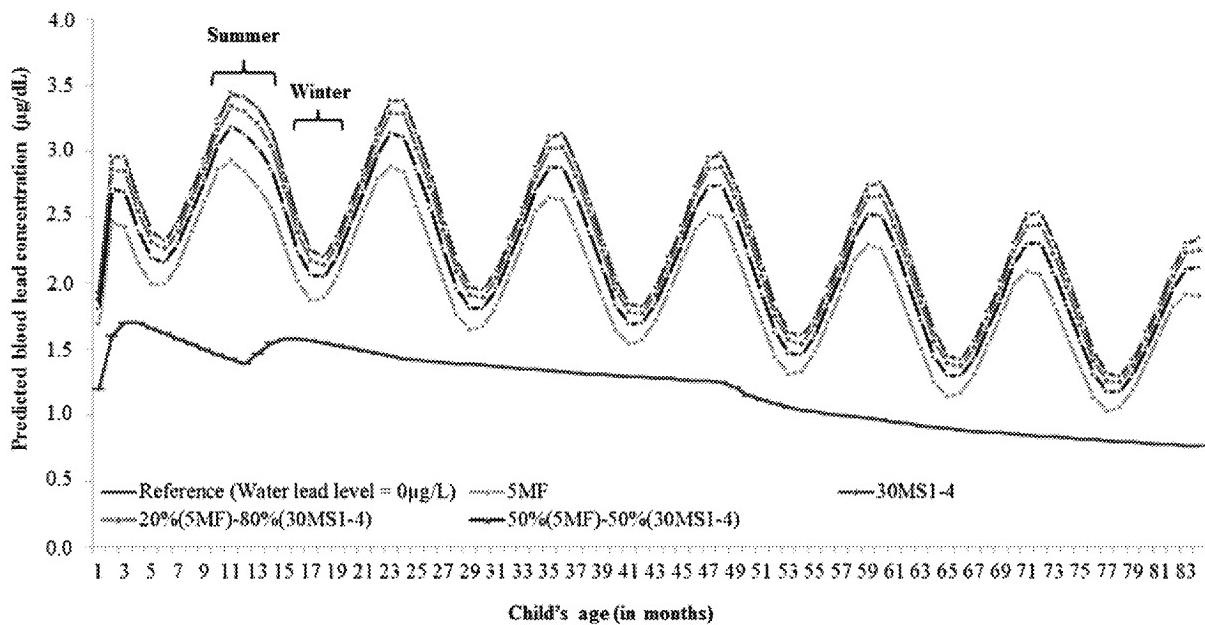


Fig. 2. Predicted distribution of blood lead concentration by child's age and for different exposure scenarios. 5MF: the child is exclusively exposed to water collected after 5 min of flushing; 30MS1-4: the child is exclusively exposed to the mean of the four 1-L samples collected after 30 min of stagnation; 20%(5MF)-80%(30MS1-4): the child consumes 20% of flushed sample and 80% of stagnant sample; 50%(5MF)-50%(30MS1-4): the child consumes 50% of flushed sample and 50% of stagnant sample.

Sensitivity analyses performed after excluding single-homes indicate that children living in row- or multi-level houses are less likely to show BLLs $\geq 5 \mu\text{g}/\text{dL}$ during summer months (Supplemental material, Fig. S5). Results suggest that, by flushing water at least 5 min before consumption, the proportion of children exceeding $5 \mu\text{g}/\text{dL}$ during summer will still remain under 10.5% whatever the child's age is. Moreover, flushing habits could reduce the likelihood of having BLLs $\geq 5 \mu\text{g}/\text{dL}$ in warm months by at least 40% in children aged 0.5–2 years. Finally, if the WLL was set to a constant value of $0 \mu\text{g}/\text{L}$, the resulting percent of children exceeding the threshold of $5 \mu\text{g}/\text{dL}$ was very low (1% for

children aged 0.5–2 years and less than 1% for those aged above 2 years). The resulting mean BLLs predicted between June and August were $1.5 \mu\text{g}/\text{dL}$ in children aged 0.5–2 year and decrease with child's age ($0.8 \mu\text{g}/\text{dL}$ for those aged 6–7 years). This represents BLLs from other lead sources.

As a whole, the summer increase in household WLL as observed in this study could impact children's BLLs. Another noteworthy implication is linked to the health of developing foetus and pregnant women living in cities with certain water lead problems. Previous studies indicated that pregnancy and lactating period are associated with marked

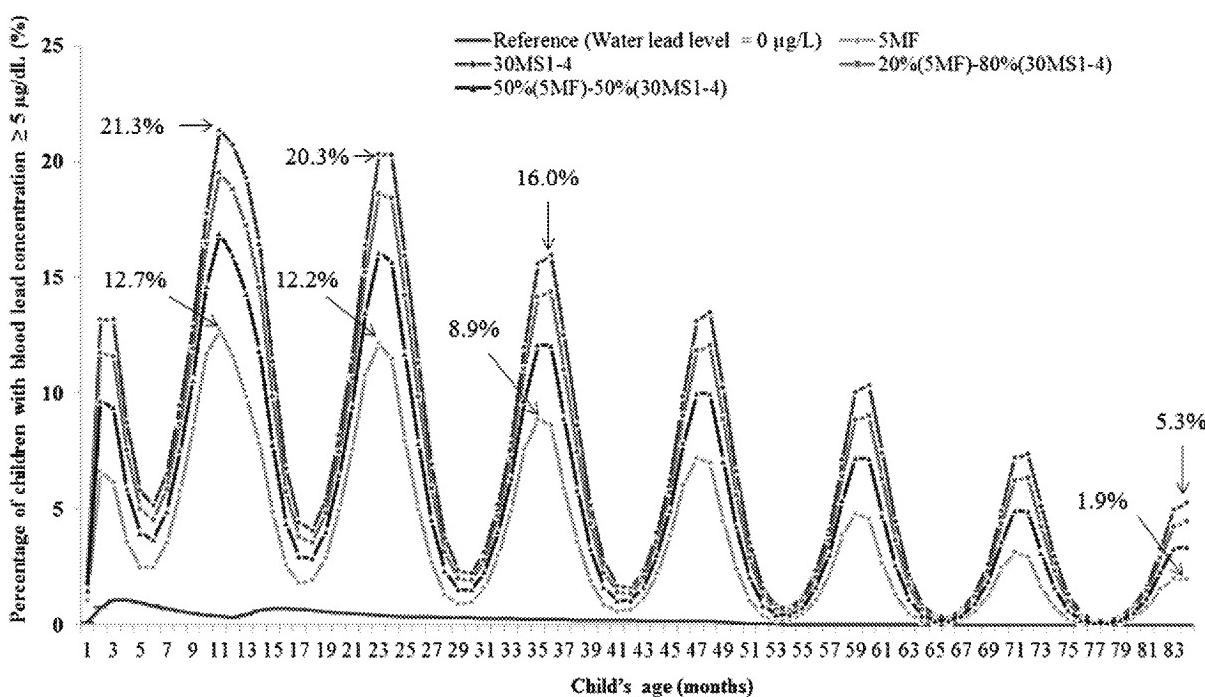


Fig. 3. Predicted distribution of percentage of children with blood lead concentration exceeding $5 \mu\text{g}/\text{dL}$ by child's age and for different exposure scenarios. 5MF: the child is exclusively exposed to water collected after 5 min of flushing; 30MS1-4: the child is exclusively exposed to the mean of the four 1-L samples collected after 30 min of stagnation; 20%(5MF)-80%(30MS1-4): the child consumes 20% of flushed sample and 80% of stagnant sample; 50%(5MF)-50%(30MS1-4): the child consumes 50% of flushed sample and 50% of stagnant sample.

increase in water intake (Ershow et al., 1991; Moya et al., 2014), and that water lead is an important determinant to pregnant women's blood lead (Baghurst et al., 1987; Fertmann et al., 2004). Given the important impact of blood lead to pregnant women and foetus in terms of preterm delivery (Taylor et al., 2014), low birth weight (Andrews et al., 1994; Nishioka et al., 2014) and early neurobehavioral development (U.S. NTP, 2011), even at low maternal blood lead, extension of trends observed in this work to pregnant and lactating women population would be surely interesting for protecting the health of that specific population.

Some study limitations need to be considered when interpreting our results: First, in the multi-level residences/row-houses, although faucets were closed during the stagnation time, we were unable to verify that water was not used in related residences. However, by adjusting for the "type of residence", we believe we corrected for the bias, if it exists. Second, we are aware that there may be other uncontrolled parameters strongly associated with WLL. For example, actual data on water usage were not available. The increased water consumption generally observed during the warm months will reduce the contact time of water with the water distribution pipe surfaces. This can play a major role on the observed lead levels at the tap. Water usage patterns are, at least partly, determined by the number of persons living at home, the type of residence, and possibly other factors (Gregory and Di Leo, 2003). By adjusting for the type of residence and the number of persons living at home, we limited the potential bias due to the absence of data on water usage. Moreover, in the Montreal area, changes in water usage patterns over the year are not evident in the row- or multi-level houses, which represent 90% of homes included in this study. Although the marked difference in WLL was observed between single-homes and row-homes at each campaign, additional analyses indicated that the change in WLL from the baseline to summer is influenced by neither type of residence nor number of persons living at home (Supplemental materials, Tables S7 & S8). The production flow rates at the drinking water plants serving the study area do not support a seasonal change in household water usages. Actually, demand values in hydraulic modelling of these areas are not adjusted for season as industrial demand and leakage are significant in this specific system. It is certainly plausible that increased household usage in summer could lead to lower stagnation times in the service lines and inner plumbing sections, but there is no data to suggest such seasonal trends in the study area. We believe that several features of our study design control for actual drinking water consumption in the household, which is the most important aspect to consider for exposure. Other household demands do not vary significantly in the types of buildings i.e. external uses for pools, gardens etc. are minimal in this dense urban area. Third, data reported here applies to a single distribution system with its proper water quality parameters and hydraulic conditions. They may not fully be generalizable to other distribution system with different characteristics. Finally, IEUBK modelling does not take into account the influence of nutritional intake which could markedly attenuate the changes in BLLs from season to season. The complex interaction between lead ingested from drinking water and nutrients makes it difficult to predict changes in BLLs with high accuracy. Moreover, this model does not consider the time spent outside (specifically at the daycare) and then assumes that the child consumes the same water (either flushed or stagnant), at the same quantity every day.

4. Conclusion

The influence of seasonality on lead concentration in household water is substantial in homes connected to lead service lines. The winter-to-summer change could reach 6 µg/L in flushed samples and 10.55 µg/L in stagnant samples. IEUBK child blood modelling predicts that such changes would lead to a slight increase of about 1 µg/dL in 0.5–7 year-old children. Although such a little increase, the percentage of children aged 1–2 years exceeding the 5 µg/dL BLL threshold could

increase by at least 15% due to winter-to-summer changes in water lead levels. Flushing habits reduce the probability for elevated BLLs, especially in children aged below 2 years.

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.envint.2014.07.005>.

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Robinson, Mikelle (DHHS)

From: Robinson, Mikelle (DCH)
Sent: Thursday, September 24, 2015 4:34 PM
To: Miller, Mark (DCH)
Subject: FW: Elevated lead found in more Flint kids after water switch, study finds

FYI.

From: Priem, Wesley F. (DCH)
Sent: Thursday, September 24, 2015 3:58 PM
To: Dykema, Linda D. (DCH); Groetsch, Kory J. (DCH); Robinson, Mikelle (DCH); Scott, Robert L. (DCH); Peeler, Nancy (DCH)
Subject: Elevated lead found in more Flint kids after water switch, study finds

[http://www.mlive.com/news/flint/index.ssf/2015/09/study shows twice as many flin.html#incart_email](http://www.mlive.com/news/flint/index.ssf/2015/09/study_shows_twice_as_many_flin.html#incart_email)

I believe Bob Scott is reviewing these findings and can report back to us...

Robinson, Mikelle (DHHS)

From: Robinson, Mikelle (DCH)
Sent: Thursday, September 24, 2015 2:27 PM
To: Minicuci, Angela (DCH)
Cc: Peeler, Nancy (DCH); Scott, Robert L. (DCH); Lasher, Geralyn (DCH); Eisner, Jennifer (DCH); Hertel, Elizabeth (DCH); Moran, Susan (DCH); Miller, Mark (DCH)
Subject: RE: Flint lead data

Mark Valacak (health officer) informed me that he sent some recommended revisions to the city water department for the advisory and will forward it to me when it is available. So, I assume an advisory is still being planned.

From: Minicuci, Angela (DCH)
Sent: Thursday, September 24, 2015 2:07 PM
To: Peeler, Nancy (DCH); Scott, Robert L. (DCH); Lasher, Geralyn (DCH); Eisner, Jennifer (DCH); Robinson, Mikelle (DCH); Moran, Susan (DCH); Hertel, Elizabeth (DCH)
Subject: FW: Flint lead data

The Next Steps slide no longer recommends that the city declare a health advisory. It now says 'support city's health advisory'. If Flint will be issuing a health advisory, will Genesee County support this?

Angela

From: Murray, David (GOV)
Sent: Thursday, September 24, 2015 1:56 PM
To: Hollins, Harvey (GOV) <hollinsh@michigan.gov>; Minicuci, Angela (DCH) <MinicuciA@michigan.gov>; Eisner, Jennifer (DCH) <EisnerJ@michigan.gov>; Clement, Elizabeth (GOV) <clemente@michigan.gov>; Muchmore, Dennis (GOV) <muchmored@michigan.gov>; Agen, Jarrod (GOV) <AgenJ@michigan.gov>; Wurfel, Sara (GOV) <Wurfels@michigan.gov>; Wurfel, Brad (DEQ) <WurfelB@michigan.gov>; Tommasulo, Karen (DEQ) <TommasuloK@michigan.gov>
Cc: Biehl, Laura (GOV) <BiehlL@michigan.gov>; Brown, Jessica (GOV) <BrownJ53@michigan.gov>; Heaton, Anna (GOV) <HeatonA@michigan.gov>
Subject: Flint lead data

Team,

Here's the data that will be presented at the Hurley Hospital press conference at 3 p.m. As you'll see, they are pointing to individual children, a very emotional approach. Our challenge will be to show how our state data is different from what the hospital and the coalition members are presenting today.

Dave

----- Forwarded message -----

From: Andy Leavitt <aleavitt@senatedems.org>
Date: Thu, Sep 24, 2015 at 1:41 PM
Subject: Data
To: Angela Wittrock <awittrock@senatedems.org>

Hey Angela,

Sorry for the delay. Dr. Mona Hanna-Attisha wanted to make a few changes to one of her slides.

Andy

Robinson, Mikelle (DHHS)

From: Robinson, Mikelle (DCH)
Sent: Thursday, September 24, 2015 2:14 PM
To: Lasher, Geralyn (DCH); Hertel, Elizabeth (DCH)
Cc: Moran, Susan (DCH); Miller, Mark (DCH)
Subject: FW: Env. Health Perspectives on Washington DC. lead in Drinking Water
Attachments: Pages from CLPPP 2013 Data Report.pdf; 2014 Lead Testing and EBLL 0-5 072015.pdf

FYI – on the call with EPA that Wes participated in today.

From: Priem, Wesley F. (DCH)
Sent: Thursday, September 24, 2015 1:31 PM
To: Klevs, Mardi (klevs.mardi@epa.gov); Martig, Anton (Tony) (martig.anton@epa.gov)
Cc: Miller, Corinne (DCH); Robinson, Mikelle (DCH); Dykema, Linda D. (DCH); Groetsch, Kory J. (DCH); Peeler, Nancy (DCH); Scott, Robert L. (DCH)
Subject: FW: Env. Health Perspectives on Washington DC. lead in Drinking Water

Mardi and Tony;

I will be sending you at three emails regarding the Flint lead in water concern. This being the article on the D.C. study an a summary of our meeting. I will also send you a response DEQ has prepared and also the M Live article.

Summary from our meeting this morning:

1. Dialog regarding the DEG Frequently asked questions and there was no objections to the information presented.
2. Discussion on who was taking the lead from the municipalities whether it was the city of Genesee County Health Department. It appears the city and mayor is taking the lead.
3. Local Health Department is working on preparing information for the public
4. Information being prepared from our, State, CLPPP and this information can still be revised to include more information on drinking water.
5. Our Environmental Toxicological Section can provide assistance if needed for the public outreach materials, although the staff person who would do this work is on vacation till next week.
6. CLPPP is working to review the epi study and will prepare a power point to explain what the results imply. They will work closely with the Department's epidemiologist who prepared the first results to ensure validity and the proper discussion of the study.
7. The idea of providing filters to the public was discussed. A call to the National Sanitation Foundation was made to discuss this issue further and determine proper filters.
8. CLPPP can provide EPA with 2013- 2014. See attached. 2015 data-to-date is not yet available but can be later if needed.
9. Our department was informed while we were meeting the Flint advocates along with others are to be holding a press conference at 3:00 today. The advocates are demanding that the water supply revert back to the city of Detroit's drinking water.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1868000/>

Excerpt below with the plan they implemented.

Following the LCR (U.S. EPA 1991), guidance from the U.S. EPA, consultation with the DC Department of Health, and its own contingency plans, in 2003 the DCWASA implemented plans for families living in homes with lead lines or testing above the LAL:

- Advisories were disseminated recommending that water lines should be flushed for 10 min before consuming drinking water.
- Specific advice for limiting exposure to children < 6 years of age and pregnant and nursing women was sent to all households with suspected lead service lines, in the form of flyers prepared in English, Spanish, Korean, Chinese, Vietnamese, and Amharic.
- Filters were distributed to homes with suspected lead service lines and later to all homes with a test result > 15 ppb (the LAL). Replacement filter cartridges were then sent to the same homes at 6-month intervals for the duration of the period of the exceedance, ending in June 2006.
- The board of directors of the DCWASA decided to adopt a voluntarily accelerated program to replace the public segment of all lead service lines in the District of Columbia, exceeding requirements of the LCR (U.S. EPA 1991).
- Homeowners were offered replacement of the private segment of lead service lines on their property, at cost, at the same time that the public segments of the lead service lines were replaced. When the public line is replaced but the private line is not, lead levels are reduced proportionally to the length of pipe replaced but not eliminated.
- Low-cost financing was arranged with a local bank for qualifying property owners who wished to replace the private part of the lead service line on their property. The DC government later made grants available to low-income eligible residents for this purpose.
- The DCWASA offered free water testing to any customer in the distribution area who requested it.

Children Tested for Lead Poisoning -- Calendar Year 2013
All Counties in Michigan

Children less than Six Years of Age

County				Children Tested		Children Tested, by Highest Blood Lead Level (BLL)									
	% Pre-1950 Housing	% Pre-1978 Housing	Children less than Six Years of Age	Number of Children Tested	% Tested	<5 ug/dL (capillary or venous)	5 to 9 ug/dL (capillary or venous)	Capillary >= 10 ug/dL, not confirmed by venous	Confirmed 10-19 ug/dL (venous only)	Confirmed 20-44 ug/dL (venous only)	Confirmed ≥45 ug/dL (venous only)	Total ≥ 5 ug/dL	Total Confirmed >= 10 ug/dL	% with BLL ≥ 5 ug/dL	% with Confirmed BLL >= 10 ug/dL
Alcona	12.4	61.5	415	51	12.3	50	1	0	0	0	0	1	0	2.0	0.0
Alger	29.5	64.1	461	76	16.5	75	1	0	0	0	0	1	0	1.3	0.0
Allegan	23.2	51.1	9,036	1,159	12.8	1,124	31	2	2	0	0	35	2	3.0	0.2
Alpena	25.3	71.6	1,766	302	17.1	295	6	1	0	0	0	7	0	2.3	0.0
Antrim	18.8	52.6	1,393	258	18.5	252	5	1	0	0	0	6	0	2.3	0.0
Arenac	19.8	58.2	894	163	18.2	161	2	0	0	0	0	2	0	1.2	0.0
Baraga	34.0	71.7	510	128	25.1	127	1	0	0	0	0	1	0	0.8	0.0
Barry	27.1	57.3	4,307	465	10.8	454	10	2	0	0	0	12	0	2.6	0.0
Bay	33.9	75.6	7,477	1,421	19.0	1,350	63	0	7	1	0	71	8	5.0	0.6
Benzie	18.6	46.3	1,119	231	20.6	225	6	0	0	0	0	6	0	2.6	0.0
Berrien	28.6	72.2	11,779	1,728	14.7	1,664	52	0	10	2	0	64	12	3.7	0.7
Branch	30.9	65.3	3,524	765	21.7	726	35	3	0	1	0	39	1	5.1	0.1
Calhoun	36.1	75.3	10,445	1,970	18.9	1,902	54	3	7	4	0	68	11	3.5	0.6
Cass	22.4	59.9	3,615	458	12.7	438	16	3	1	0	0	20	1	4.4	0.2
Charlevoix	25.3	54.4	1,655	297	17.9	295	2	0	0	0	0	2	0	0.7	0.0
Cheboygan	20.9	53.5	1,462	266	18.2	264	0	2	0	0	0	2	0	0.8	0.0
Chippewa	25.1	58.6	2,374	435	18.3	430	5	0	0	0	0	5	0	1.1	0.0
Clare	14.5	58.8	2,110	414	19.6	411	3	0	0	0	0	3	0	0.7	0.0
Clinton	22.5	52.8	5,279	565	10.7	553	12	0	0	0	0	12	0	2.1	0.0
Crawford	13.7	55.6	775	87	11.2	81	6	0	0	0	0	6	0	6.9	0.0
Delta	33.3	68.0	2,441	453	18.6	435	15	2	1	0	0	18	1	4.0	0.2
Dickinson	38.9	71.7	1,661	303	18.2	296	4	2	1	0	0	7	1	2.3	0.3
Eaton	20.4	56.4	7,375	1,132	15.3	1,117	13	2	0	0	0	15	0	1.3	0.0
Emmet	23.0	48.3	2,080	322	15.5	320	2	0	0	0	0	2	0	0.6	0.0
Genesee	19.9	68.0	32,974	7,067	21.4	6,909	134	13	5	6	0	158	11	2.2	0.2
Gladwin	12.4	49.5	1,527	245	16.0	240	5	0	0	0	0	5	0	2.0	0.0
Gogebic	50.0	76.7	869	193	22.2	188	5	0	0	0	0	5	0	2.6	0.0
Grand Traverse	14.7	43.5	6,080	1,032	17.0	995	30	7	0	0	0	37	0	3.6	0.0
Gratiot	34.7	69.8	2,814	475	16.9	468	7	0	0	0	0	7	0	1.5	0.0
Hillsdale	36.5	63.2	3,339	788	23.6	762	24	1	1	0	0	26	1	3.3	0.1
Houghton	53.4	75.5	2,528	538	21.3	514	23	0	0	1	0	24	1	4.5	0.2
Huron	31.8	68.9	1,901	394	20.7	371	22	0	1	0	0	23	1	5.8	0.3
Ingham	24.9	68.2	19,293	4,702	24.4	4,487	208	2	4	1	0	215	5	4.6	0.1
Ionia	35.8	63.0	4,937	825	16.7	811	12	1	1	0	0	14	1	1.7	0.1
Iosco	12.7	65.6	1,183	146	12.3	142	3	1	0	0	0	4	0	2.7	0.0
Iron	44.1	72.1	579	149	25.7	146	3	0	0	0	0	3	0	2.0	0.0
Isabella	16.3	48.2	4,294	731	17.0	723	6	1	0	1	0	8	1	1.1	0.1
Jackson	33.0	67.9	11,435	2,965	25.9	2,777	162	12	13	2	1	190	16	6.4	0.5
Kalamazoo	22.5	62.6	18,472	3,536	19.1	3,411	104	12	10	1	0	127	11	3.6	0.3
Kalkaska	13.2	49.3	1,218	223	18.3	219	4	0	0	0	0	4	0	1.8	0.0
Kent	24.8	59.2	52,878	10,376	19.6	9,825	483	15	43	9	1	551	53	5.3	0.5
Keweenaw	46.9	77.6	119	28	23.5	26	2	0	0	0	0	2	0	7.1	0.0
Lake	12.5	52.6	597	121	20.3	120	1	0	0	0	0	1	0	0.8	0.0
Lapeer	20.4	52.9	5,814	1,052	18.1	1,013	38	1	0	0	0	39	0	3.7	0.0
Leelanau	17.9	46.5	1,119	213	19.0	206	6	1	0	0	0	7	0	3.3	0.0

Children Tested for Lead Poisoning -- Calendar Year 2013

All Counties in Michigan

Children less than Six Years of Age

				Children Tested		Children Tested, by Highest Blood Lead Level (BLL)										
County	%Pre-1950 Housing	%Pre-1978 Housing	Children less than Six Years of Age	Number of Children Tested	% Tested	<5 ug/dL (capillary or venous)	5 to 9 ug/dL (capillary or venous)	Capillary >= 10 ug/dL, not confirmed by venous	Confirmed 10-19 ug/dL (venous only)	Confirmed 20-44 ug/dL (venous only)	Confirmed >=55 ug/dL (venous only)	Total ≥ 5 ug/dL	Total Confirmed >= 10 ug/dL	% with BLL >= 5 ug/dL	% with Confirmed BLL >= 10 ug/dL	
Lenawee	33.6	67.2	6,995	1,512	21.6	1,425	72	11	3	1	0	87	4	5.8	0.3	
Livingston	11.4	39.0	12,406	1,106	8.9	1,094	11	0	0	1	0	12	1	1.1	0.1	
Luce	23.8	64.3	374	73	19.5	71	2	0	0	0	0	2	0	2.7	0.0	
Mackinac	23.4	58.6	560	116	20.7	110	6	0	0	0	0	6	0	5.2	0.0	
Macomb	9.3	59.1	58,786	10,093	17.2	9,937	130	8	12	6	2	158	20	1.6	0.2	
Manistee	28.8	63.9	1,324	248	18.7	233	12	1	2	0	0	15	2	6.0	0.8	
Marquette	27.9	69.4	4,050	514	12.7	494	17	1	2	0	0	20	2	3.9	0.4	
Mason	32.1	64.6	1,886	362	19.2	323	33	5	2	0	0	40	2	11.0	0.6	
Mecosta	18.2	53.4	2,644	367	13.9	361	6	0	0	0	0	6	0	1.6	0.0	
Menominee	35.4	73.2	1,434	262	18.3	252	9	0	1	0	0	10	1	3.8	0.4	
Midland	15.2	58.7	5,746	501	8.7	493	7	1	0	0	0	8	0	1.6	0.0	
Missaukee	21.2	56.2	1,120	133	11.9	133	0	0	0	0	0	0	0	0.0	0.0	
Monroe	23.0	59.0	10,597	1,705	16.1	1,663	39	3	0	0	0	42	0	2.5	0.0	
Montcalm	27.3	57.7	4,666	615	13.2	607	8	0	0	0	0	8	0	1.3	0.0	
Montmorency	18.1	58.6	424	80	18.9	80	0	0	0	0	0	0	0	0.0	0.0	
Muskegon	25.8	66.2	13,543	3,022	22.3	2,877	124	7	12	2	0	145	14	4.8	0.5	
Newaygo	19.3	53.6	3,686	426	11.6	422	4	0	0	0	0	4	0	0.9	0.0	
Oakland	14.7	60.5	83,905	14,244	17.0	14,025	188	8	20	4	1	221	25	1.6	0.2	
Oceana	25.8	57.8	2,130	515	24.2	498	14	1	2	0	0	17	2	3.3	0.4	
Ogemaw	12.8	61.6	1,271	96	7.6	94	2	0	0	0	0	2	0	2.1	0.0	
Ontonagon	39.1	73.2	280	48	17.1	48	0	0	0	0	0	0	0	0.0	0.0	
Osceola	22.6	56.6	1,748	362	20.7	350	8	0	1	2	1	12	4	3.3	1.1	
Oscoda	17.8	62.1	541	48	8.9	47	1	0	0	0	0	1	0	2.1	0.0	
Otsego	12.2	50.3	1,654	316	19.1	315	1	0	0	0	0	0	1	0	0.3	
Ottawa	15.7	45.3	21,541	2,928	13.6	2,836	82	7	3	0	0	92	3	3.1	0.1	
Presque Isle	21.1	66.3	640	121	18.9	121	0	0	0	0	0	0	0	0.0	0.0	
Roscommon	13.1	58.7	1,159	216	18.6	212	4	0	0	0	0	4	0	1.9	0.0	
Saginaw	28.1	73.1	14,346	3,775	26.3	3,646	110	6	12	1	0	129	13	3.4	0.3	
St Clair	25.8	59.4	11,371	2,597	22.8	2,477	109	9	3	0	0	121	3	4.7	0.1	
St Joseph	27.5	65.1	5,155	981	19.0	943	32	4	1	1	0	38	2	3.9	0.2	
Sanilac	30.7	64.6	3,012	544	18.1	527	16	0	1	0	0	17	1	3.1	0.2	
Schoolcraft	25.5	63.3	465	88	18.9	88	0	0	0	0	0	0	0	0.0	0.0	
Shiawassee	33.9	68.2	4,734	1,230	26.0	1,184	40	1	3	2	0	46	5	3.7	0.4	
Tuscola	30.2	67.4	3,772	906	24.0	885	21	0	0	0	0	21	0	2.3	0.0	
Van Buren	23.3	58.1	5,982	879	14.7	859	15	1	4	0	0	20	4	2.3	0.5	
Washtenaw	17.2	56.5	22,904	2,743	12.0	2,696	43	1	2	1	0	47	3	1.7	0.1	
Wayne ex Det	22.6	74.5	82,994	19,466	23.5	18,980	408	27	43	11	0	489	54	2.5	0.3	
Wexford	23.0	53.7	2,588	329	12.7	319	9	1	0	0	0	10	0	3.0	0.0	
Detroit, City of	62.2	93.2	60,638	25,026	41.3	23,030	1,583	63	281	62	7	1,996	350	8.0	1.4	
MICHIGAN	24.7	64.8	720,994	147,841	20.5	142,153	4,793	256	517	123	13	5,702	653	3.9	0.4	

Sources: US Census Bureau, Census 2010 (Pre-1950 Housing and Pre-1978 Housing) and American Community Survey 2012 5-year estimates (Detroit and county populations); MDCH Data Warehouse (children tested)

April 30, 2014

Children Tested for Lead Poisoning -- Calendar Year 2014
All Counties in Michigan

Children less than Six Years of Age

County				Children Tested		Children Tested, by Highest Blood Lead Level (BLL)											
	% Pre-1950 Housing	% Pre-1978 Housing	Children less than Six Years of Age	Number of Children Tested	% Tested	<5 ug/dL	5 to 9 ug/dL, not confirmed by venous	≥ 10 ug/dL, not confirmed by venous	Confirmed ≤ 9 ug/dL (venous only)	Confirmed 10-14 ug/dL (venous only)	Confirmed 15-44 ug/dL (venous only)	Confirmed ≥ 45 ug/dL (venous only)	Total confirmed ≥ 5 ug/dL	% with confirmed BLL ≥ 5 ug/dL	Total ≥ 5 ug/dL, confirmed & unconfirmed*	% with BLL ≥ 5 ug/dL, confirmed & unconfirmed*	
Alcona	12.4	61.5	398	53	13.3	51	2	0	0	0	0	0	0	0.0	2	3.8	
Alger	29.5	64.1	427	92	21.5	90	1	0	0	1	0	0	1	1.1	2	2.2	
Allegan	23.2	51.1	8,806	1,208	13.7	1,177	26	2	3	0	0	0	3	0.2	31	2.6	
Alpena	25.3	71.6	1,758	257	14.6	248	7	1	1	0	0	0	1	0.4	9	3.5	
Antrim	18.8	52.6	1,370	260	19.0	258	0	0	2	0	0	0	2	0.8	2	0.8	
Arenac	19.8	58.2	870	186	21.4	185	1	0	0	0	0	0	0	0.0	1	0.5	
Baraga	34.0	71.7	477	135	28.3	134	1	0	0	0	0	0	0	0.0	1	0.7	
Barry	27.1	57.3	4,143	491	11.9	468	19	0	3	1	0	0	4	0.8	23	4.7	
Bay	33.9	75.6	7,322	1,408	19.2	1,358	31	2	10	3	3	1	17	1.2	50	3.6	
Benzie	18.6	46.3	1,041	268	25.7	266	2	0	0	0	0	0	0	0.0	2	0.7	
Berrien	28.6	72.2	11,681	1,943	16.6	1,884	24	5	21	4	5	0	30	1.5	59	3.0	
Branch	30.9	65.3	3,506	668	19.1	645	18	1	1	3	0	0	4	0.6	23	3.4	
Calhoun	36.1	75.3	10,149	2,390	23.5	2,290	36	0	51	7	6	0	64	2.7	100	4.2	
Cass	22.4	59.9	3,444	426	12.4	414	7	1	3	1	0	0	4	0.9	12	2.8	
Charlevoix	25.3	54.4	1,624	295	18.2	294	1	0	0	0	0	0	0	0.0	1	0.3	
Cheboygan	20.9	53.5	1,414	286	20.2	279	6	0	1	0	0	0	1	0.3	7	2.4	
Chippewa	25.1	58.6	2,345	440	18.8	436	1	0	3	0	0	0	3	0.7	4	0.9	
Clare	14.5	58.8	2,083	446	21.4	442	4	0	0	0	0	0	0	0.0	4	0.9	
Clinton	22.5	52.8	5,140	585	11.4	579	1	0	5	0	0	0	5	0.9	6	1.0	
Crawford	13.7	55.6	727	85	11.7	84	1	0	0	0	0	0	0	0.0	1	1.2	
Delta	33.3	68.0	2,388	413	17.3	397	14	0	1	0	1	0	2	0.5	16	3.9	
Dickinson	38.9	71.7	1,575	318	20.2	317	0	0	1	0	0	0	1	0.3	1	0.3	
Eaton	20.4	56.4	7,356	1,140	15.5	1,113	20	3	4	0	0	0	4	0.4	27	2.4	
Emmet	23.0	48.3	2,042	362	17.7	362	0	0	0	0	0	0	0	0.0	0	0.0	
Genesee	19.9	68.0	31,997	6,824	21.3	6,646	97	11	56	9	5	0	70	1.0	178	2.6	
Gladwin	12.4	49.5	1,495	291	19.5	291	0	0	0	0	0	0	0	0.0	0	0.0	
Gogebic	50.0	76.7	855	154	18.0	152	2	0	0	0	0	0	0	0.0	2	1.3	
Grand Traverse	14.7	43.5	6,000	1,371	22.9	1,359	6	3	3	0	0	0	3	0.2	12	0.9	
Gratiot	34.7	69.8	2,754	496	18.0	491	4	0	1	0	0	0	1	0.2	5	1.0	
Hillsdale	36.5	63.2	3,283	814	24.8	795	14	2	3	0	0	0	3	0.4	19	2.3	
Houghton	53.4	75.5	2,477	599	24.2	585	6	0	4	2	2	0	8	1.3	14	2.3	
Huron	31.8	68.9	1,873	393	21.0	381	9	0	2	1	0	0	3	0.8	12	3.1	
Ingham	24.9	68.2	19,248	4,747	24.7	4,606	94	5	25	11	6	0	42	0.9	141	3.0	
Ionia	35.8	63.0	4,878	843	17.3	816	20	2	4	0	1	0	5	0.6	27	3.2	
Iosco	12.7	65.6	1,233	150	12.2	146	3	0	1	0	0	0	1	0.7	4	2.7	
Iron	44.1	72.1	573	138	24.1	135	3	0	0	0	0	0	0	0.0	3	2.2	
Isabella	16.3	48.2	4,208	640	15.2	632	7	0	1	0	0	0	1	0.2	8	1.3	
Jackson	33.0	67.9	11,296	2,757	24.4	2,602	107	14	27	3	4	0	34	1.2	155	5.6	
Kalamazoo	22.5	62.6	18,588	3,257	17.5	3,172	48	7	23	4	2	1	30	0.9	85	2.6	
Kalkaska	13.2	49.3	1,180	217	18.4	216	1	0	0	0	0	0	0	0.0	1	0.5	
Kent	24.8	59.2	52,655	10,115	19.2	9,645	325	8	89	22	26	0	137	1.4	470	4.6	
Keweenaw	46.9	77.6	115	25	21.7	23	2	0	0	0	0	0	0	0.0	2	8.0	
Lake	12.5	52.6	585	120	20.5	118	2	0	0	0	0	0	0	0.0	2	1.7	
Lapeer	20.4	52.9	5,687	919	16.2	890	22	3	3	0	1	0	4	0.4	29	3.2	
Leelanau	17.9	46.5	1,111	239	21.5	234	4	1	0	0	0	0	0	0.0	5	2.1	
Lenawee	33.6	67.2	6,911	1,196	17.3	1,074	78	16	21	3	4	0	28	2.3	122	10.2	

Children Tested for Lead Poisoning -- Calendar Year 2014

All Counties in Michigan

Children less than Six Years of Age

County				Children Tested		Children Tested, by Highest Blood Lead Level (BLL)											
	%Pre-1950 Housing	%Pre-1978 Housing	Children less than Six Years of Age	Number of Children Tested	% Tested	<5 ng/dL	5 to 9 ug/dL, not confirmed by venous	>= 10 ug/dL, not confirmed by venous	Confirmed 5-9 ug/dL (venous only)	Confirmed 10-14 ug/dL (venous only)	Confirmed 15-44 ug/dL (venous only)	Confirmed >45 ug/dL (venous only)	Total confirmed ≥ 5 ug/dL	% with confirmed BLL >= 5 ug/dL	Total ≥ 5 ug/dL, confirmed & unconfirmed*	% with BLL >= 5 ug/dL, confirmed & unconfirmed*	
Livingston	11.4	39.0	12,104	1,026	8.5	1,017	4	0	4	1	0	0	5	0.5	9	0.9	
Luce	23.8	64.3	370	88	23.8	88	0	0	0	0	0	0	0	0.0	0	0.0	
Mackinac	23.4	58.6	587	130	22.1	129	1	0	0	0	0	0	0	0.0	1	0.8	
Macomb	9.3	59.1	57,878	9,525	16.3	9,397	73	6	38	2	7	2	49	0.5	128	1.3	
Manistee	28.8	63.9	1,307	284	21.7	271	10	0	1	0	2	0	3	1.1	13	4.6	
Marquette	27.9	69.4	4,029	471	11.7	458	3	2	8	0	0	0	8	1.7	13	2.8	
Mason	32.1	64.6	1,864	414	22.2	387	25	0	2	0	0	0	2	0.5	27	6.5	
Mecosta	18.2	53.4	2,520	316	12.5	314	0	0	0	0	2	0	2	0.6	2	0.6	
Menominee	35.4	73.2	1,375	261	19.0	245	11	1	3	0	1	0	4	1.5	16	6.1	
Midland	15.2	58.7	5,685	477	8.4	472	2	0	2	1	0	0	3	0.6	5	1.0	
Missaukee	21.2	56.2	1,111	133	12.0	132	0	0	0	1	0	0	1	0.8	1	0.8	
Monroe	23.0	59.0	10,355	1,571	15.2	1,553	15	1	1	1	0	0	2	0.1	18	1.1	
Montcalm	27.3	57.7	4,527	748	16.5	735	6	0	5	1	1	0	7	0.9	13	1.7	
Montmorency	18.1	58.6	404	83	20.5	82	1	0	0	0	0	0	0	0.0	1	1.2	
Muskegon	25.8	66.2	13,224	2,572	19.4	2,415	66	13	62	10	6	0	78	3.0	157	6.1	
Newaygo	19.3	53.6	3,581	447	12.5	440	6	1	0	0	0	0	0	0.0	7	1.6	
Oakland	14.7	60.5	83,501	14,308	17.1	14,102	94	8	71	20	13	0	104	0.7	206	1.4	
Oceana	25.8	57.8	2,091	516	24.7	506	5	0	2	3	0	0	5	1.0	10	1.9	
Ogemaw	12.8	61.6	1,289	102	7.9	101	0	0	1	0	0	0	1	1.0	1	1.0	
Ontonagon	39.1	73.2	251	48	19.1	46	2	0	0	0	0	0	0	0.0	2	4.2	
Osceola	22.6	56.6	1,723	334	19.4	324	4	0	2	2	2	0	6	1.8	10	3.0	
Oscoda	17.8	62.1	521	35	6.7	32	2	1	0	0	0	0	0	0.0	3	8.6	
Otsego	12.2	50.3	1,641	325	19.8	324	1	0	0	0	0	0	0	0.0	1	0.3	
Ottawa	15.7	45.3	21,390	3,012	14.1	2,931	59	5	16	1	0	0	17	0.6	81	2.7	
Presque Isle	21.1	66.3	597	111	18.6	109	2	0	0	0	0	0	0	0.0	2	1.8	
Roscommon	13.1	58.7	1,156	218	18.9	218	0	0	0	0	0	0	0	0.0	0	0.0	
Saginaw	28.1	73.1	14,029	3,670	26.2	3,548	76	8	25	7	6	0	38	1.0	122	3.3	
Saint Clair	25.8	59.4	11,046	2,731	24.7	2,655	46	7	15	5	3	0	23	0.8	76	2.8	
Saint Joseph	27.5	65.1	5,125	1,012	19.7	971	27	4	7	2	1	0	10	1.0	41	4.1	
Sanilac	30.7	64.6	2,879	523	18.2	517	4	0	1	1	0	0	2	0.4	6	1.1	
Schoolcraft	25.5	63.3	471	99	21.0	98	0	0	1	0	0	0	1	1.0	1	1.0	
Shiawassee	33.9	68.2	4,622	1,169	25.3	1,131	19	2	15	2	0	0	17	1.5	38	3.3	
Tuscola	30.2	67.4	3,579	886	24.8	874	10	0	0	2	0	0	2	0.2	12	1.4	
Van Buren	23.3	58.1	5,884	862	14.6	832	9	1	17	1	2	0	20	2.3	30	3.5	
Washtenaw	17.2	56.5	22,833	2,604	11.4	2,572	15	2	10	2	3	0	15	0.6	32	1.2	
Wayne ex Det	22.6	74.5	82,002	18,348	22.4	16,021	164	12	185	33	15	0	233	1.3	409	2.2	
Wexford	23.0	53.7	2,582	362	14.0	359	1	0	0	0	2	0	2	0.6	3	0.8	
Detroit, City of	62.2	93.2	59,755	22,842	38.2	20,966	279	51	1,183	214	145	4	1,546	6.8	1,876	8.2	
MICHIGAN	24.7	64.8	710,976	143,123	20.1	136,152	2,119	212	2,050	387	277	8	2,722	1.9	5,053	3.5	

*These columns are included for comparison with previous years' data

July 20, 2015

Sources: US Census Bureau, Census 2010 (Pre-1950 Housing and Pre-1978 Housing) and American Community Survey 2013 5-year estimates (Detroit and county populations); MDCH Data Warehouse (children tested)

Priem, Wesley F. (DCH)

From: Dykema, Linda D. (DCH)
Sent: Wednesday, September 23, 2015 10:09 AM
To: Priem, Wesley F. (DCH); Miller, Corinne (DCH)
Subject: Fw: Health Education Call - Pb Outreach

Linda D. Dykema, Ph.D.
Toxicology and Response Section Manager

From: Groetsch, Kory J. (DCH)
Sent: Tuesday, September 22, 2015 5:22:32 PM
To: Dykema, Linda D. (DCH)
Cc: Bruneau, Michelle (DCH)
Subject: Health Education Call - Pb Outreach

Linda,

I moderated the conference call with the attendees listed below on 9/22/2015 discussing lead (Pb) outreach in the city of Flint. The purpose of the call was to facilitate introductions, and identify Pb health education materials, current PB outreach efforts in Flint and existing resources. DEQ provided a brief background of the drinking water compliance process in relation to efforts being conducted in Flint. Information sharing occurred between attendees about the Pb in drinking water sampling efforts in Flint.

Each agency/department listed their current health education efforts and available resources that could be made available relative to Pb outreach in Flint. The CLPPP provides some limited funding to prosperity region 6 to conduct Pb outreach. CLPPP is building a Pb Tool Kit for providers. Information about Pb in drinking water does not currently exist in these materials, but they are interested to build that information into the tool kit. DEQ has contacts with the Flint's drinking water program. GCHD has been getting many phone calls and they have had to create factsheets about water hardness and trihalomethanes.

Action Items from the Call:

1. Participants will e-mail their Pb outreach materials and presentations that are in current use to Michelle Bruneau (BruneauM@michigan.gov).
2. GCHD will send Michelle a list of concerns they have been getting from the Flint community.
3. Michelle will look over the materials to assess what messages are covered, what messages are not covered, and provide suggestions on what work may need to be done to address gaps.
4. Follow-up is needed on the water sampling directions being provided by the city to homeowners that request a Pb in tap water analysis. (There are two sampling procedures depending on the purpose of the water sample.)
5. Karen Lishinski will provide a contact at WIC, so they can be invited to our follow-up conference call.
6. MDHHS-DEH will arrange a follow-up conference call in approximately two weeks.

Attendees:

Dawn Hallwood (Genesee Co HD)
James Henry (GCHD)
Mark Valacak (GCHD)
Brad Wurfel (DEQ)

Liane Shekter-Smith (DEQ)
Richard Benzie (DEQ)
Stephen Busch (DEQ)
Nancy Peeler (DHHS)
Karen Lishinski (DHHS)
Linda Dykema (DHHS)
Kory Groetsch (DHHS)
Michelle Bruneau (DHHS)

Kory Groetsch, MS , Manager
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Robinson, Mikelle (DHHS)

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 23, 2015 5:33 PM
To: Travis, Rashmi (DHHS); Robinson, Mikelle (DHHS); Lasher, Geralyn (DHHS); Hertel, Elizabeth (DHHS)
Cc: Fink, Brenda (DHHS)
Subject: Childhood Lead Poisoning Prevention program documents
Attachments: Flint Testing and EBLLs_updated 092315_with notes.pdf; Pediatric Lead Exposure Flint Water.from Hurley.pdf

Importance: High

Hello – I'm going to send a series of emails with materials you have asked for, as a way to organize them.

The first document attached to this email is our CLPPP updated analysis of the blood lead testing data we have for children aged 0-16 in Flint. This is an update from what we sent to the Director's office earlier in the year, in that we added an additional year (2010-2011), and added data for May-August 2015 (per Geralyn's request in an email late last week).

Regarding this data:

- We are using the timeframe of May –April for this chart, because the water source change in Flint happened in April 2014. So, we started by looking at the 12 month time period from May 2014 – April 2015. Then we went back and compared that same time frame to the 4 previous years, to see if the pattern was similar, significantly different, etc.
- We included all children with a Flint address, which may not exactly conform to the city boundaries.
- We only included first time blood lead levels of ≥ 5 mcg/dL, not all subsequent tests a child may have received.
- We included all types of blood samples – venous blood draws, capillary samples, or unknown (e.g. not labeled as venous or capillary). Typically we would point to venous samples as the best, most reliable, but we had many non-venous samples, so to be inclusive added those in.

Looking at the charts, you can definitely see the seasonal impact associated with lead poisoning.

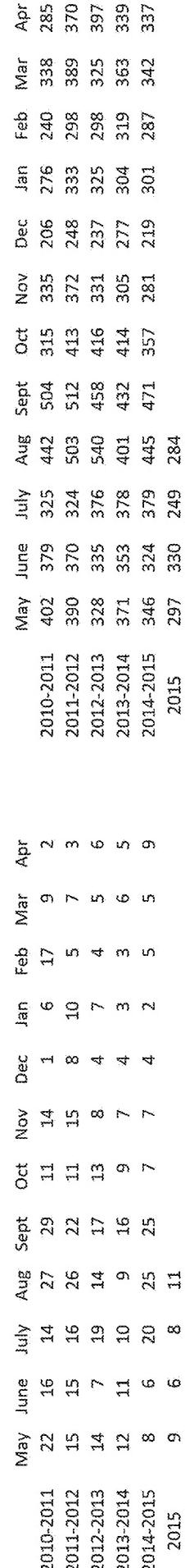
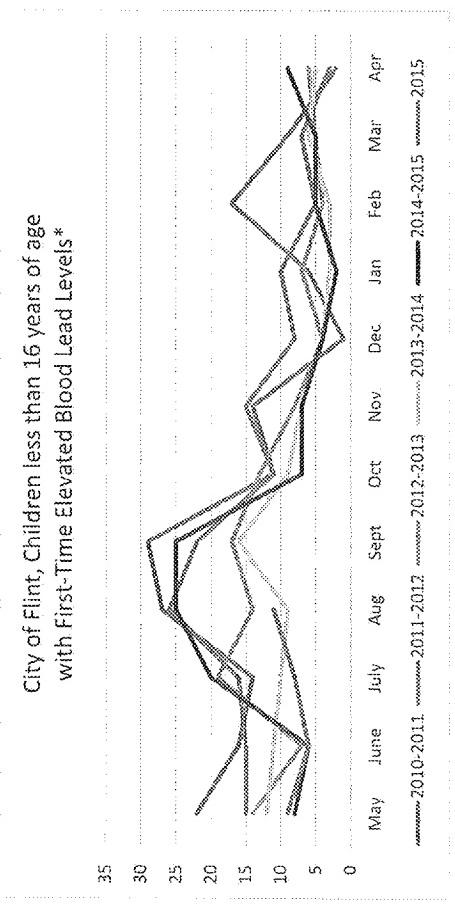
We do NOT see a different pattern of results for the 2014-2015 year, right after the change in water source. That year looks more like the data from 10-11, and 11-12.

For the full 5 years worth of data, testing rates were pretty consistent, so we don't think that is driving the data. However, note that testing levels for May-August 2015 appear to be lower than in the previous 5 years.

The second document I have attached is a presentation sent to us this morning by Dr. Mona Hanna-Attisha, from Hurley Medical Center. She shared this related to her data request that she sent to our program. In scanning it, we noted that she is using different data than we did (by age, by zip code, time frames, which years she included, etc.), so comparing our data chart to her results is like comparing apples and oranges. We have not run any analyses using her parameters. We did note some slides in her document that we might disagree with, for example her statement that water is the primary source of lead (in Michigan, it remains lead paint that is our primary source of lead exposure).

Please let us know if you have questions you have about the data charts we produced. Next email will be some of our program materials, that may be of use in the upcoming outreach effort. Also, Rashmi indicated who I should include on this email, and I trust you will share with others as appropriate.

Nancy



*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Less than 16 years of age at time of test

Includes only first-time blood lead levels ≥ 5 ug/dL

Includes sample type of venous, capillary or unknown

September 23, 2015

Source: MDHHS Data Warehouse, Lead Specimen table



Robinson, Mikelle (DCH)

From: Priem, Wesley F. (DCH)
Sent: Thursday, September 24, 2015 9:45 AM
To: Robinson, Mikelle (DCH)
Subject: FW: Env. Health Perspectives on Washington DC. lead in Drinking Water

Mikelle: Env. Health Perspectives article on Washington D. C. Lead in water and the plan they followed. One thing we could consider is water filters for families as a stop gap measure.

From: Priem, Wesley F. (DCH)
Sent: Wednesday, September 23, 2015 2:34 PM
To: Groetsch, Kory J. (DCH); Dykema, Linda D. (DCH); Miller, Corinne (DCH)
Subject: Env. Health Perspectives on Washington DC. lead in Drinking Water

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1868000/>

Excerpt below with the plan they implemented.

Following the LCR (U.S. EPA 1991), guidance from the U.S. EPA, consultation with the DC Department of Health, and its own contingency plans, in 2003 the DCWASA implemented plans for families living in homes with lead lines or testing above the LAL:

- Advisories were disseminated recommending that water lines should be flushed for 10 min before consuming drinking water.
- Specific advice for limiting exposure to children < 6 years of age and pregnant and nursing women was sent to all households with suspected lead service lines, in the form of flyers prepared in English, Spanish, Korean, Chinese, Vietnamese, and Amharic.
- Filters were distributed to homes with suspected lead service lines and later to all homes with a test result > 15 ppb (the LAL). Replacement filter cartridges were then sent to the same homes at 6-month intervals for the duration of the period of the exceedance, ending in June 2006.
- The board of directors of the DCWASA decided to adopt a voluntarily accelerated program to replace the public segment of all lead service lines in the District of Columbia, exceeding requirements of the LCR (U.S. EPA 1991).
- Homeowners were offered replacement of the private segment of lead service lines on their property, at cost, at the same time that the public segments of the lead service lines were replaced. When the public line is replaced but the private line is not, lead levels are reduced proportionally to the length of pipe replaced but not eliminated.
- Low-cost financing was arranged with a local bank for qualifying property owners who wished to replace the private part of the lead service line on their property. The DC government later made grants available to low-income eligible residents for this purpose.
- The DCWASA offered free water testing to any customer in the distribution area who requested it.

Robinson, Mikelle (DHHS)

From: Dykema, Linda D. (DCH)
Sent: Tuesday, September 22, 2015 9:54 AM
To: Lasher, Geralyn (DHHS); Peeler, Nancy (DHHS); Ruest, Karla (DHHS); Madden, Angela (DHHS); Minicuci, Angela (DHHS); Bien, Stan (DHHS)
Cc: Moran, Susan (DHHS); Robinson, Mikelle (DHHS); Fink, Brenda (DHHS); Groetsch, Kory J. (DHHS); Miller, Corinne (DHHS)
Subject: RE: Legislative call

Follow Up Flag: Follow up
Flag Status: Flagged

UPDATE:

Here is a link to the VA Tech study re city of Flint drinking water <http://flintwaterstudy.org/>. There are some presentation links in the lower right. It appears that the researchers have completed testing of a lot of water samples and the results are significantly different than the city and DEQ data. It also appears that they've held public meetings in Flint, resulting in the concerns about the safety of the Flint water that have arisen in the last few days.

I'm talking with Genesee County and the DEQ this afternoon about our outreach efforts and may know more after that call.

Linda D. Dykema, Ph.D.

Environmental Public Health Director
Division of Environmental Health
Michigan Department of Health & Human Services
517.335.8566
dykemal@michigan.gov

From: Lasher, Geralyn (DCH)
Sent: Monday, September 21, 2015 2:19 PM
To: Peeler, Nancy (DCH); Dykema, Linda D. (DCH); Ruest, Karla (DCH); Madden, Angela (DHS); Minicuci, Angela (DCH); Bien, Stan (DCH)
Cc: Moran, Susan (DCH); Robinson, Mikelle (DCH)
Subject: Legislative call
Importance: High

Nancy and Linda—we have gotten a call from legislative offices asking us to declare a “Health advisory” in Flint due to what they believe are high levels of lead in the water system so that the WIC program can then pay for bottled water and ready to feed formula for people in the Flint area.

We are fairly certain there is an actual process to handle these types of requests and the department wouldn’t just decree a health advisory if the data didn’t support it but can you help educate us on where we stand on this issue.

Thank you--g

MDHHS PH Updates Response to Flint Lead Event

Oct. 1, 2015, 9:30 am

Participants: Eden Wells, Mikelle Robinson, Jennifer Eisner, Angela Minicuci, Corinne Miller, Mark Miller, Kris Schoenow, Rashmi Travis, Elizabeth Hertel, Nancy Peeler (on the phone-Sandip Shah, Jackie Miller, Kathy Wahl, Linda Scott, Jennifer Lixey, Richard Phalen, and Kristen Hanualcik (WIC).

Status Reports

A. EPID-Corinne Miller

- Replicating Hurley study-Hurley only did % of 2014 and % of 2015
- Study by quarter-elevated blood level for children under 6 in Genesee Co. and Flint-based on tech. that Hurley used (we think). Used 501-507 zip codes the other 15 zip codes in Flint weren't populated.
- DEQ asked for data on zip code 49502.
- Map of water system-they can overlay blood let data.
- Delivery system from other study.
- Graphed trends. Decline in blood level to 2013.
- Started going up in 2014. Spiked up positive, seasonality/yearly-didn't not reach statistically
- There is an association with raise in blood level
- 17 kids were tested high with 5 or better.
- Detroit Free Press-Eden will walk her through chart.
- Corinne to send chart to group- internal not to be shared outside of group.
- 2015-going up more than historically
- Continuing to work on model-working on ways to refine model-will get talking points to Eden.
- Linda Dykema-working on Virginia Tech Study-nothing wrong with study.
- Related to corrosion.
- Virginia Study measured 1st dray at tap. 2nd draw service line to house. 3rd draw farther away from service line. Corinne will share briefing document.
- Lynda Dykema-Kinetic model-Predictive –soil sampling from DEQ, Flint, air samples, blood samples, lead paint date-running models. Taking to Dr. Lynn Wilder at ASTDE-Lead Abatement Program-ready sometime today.
- Sarah LyonCallo's group-geo coding

B MCH-Rashmi Travis/Kristin Hanualcik

- WIC-ready-made formula
- Challenges
 - Manufacturer not ready to give amounts needed
 - Manufacturer converting to powder
 - Can't produce fast enough for fast turnaround
- Genesee Local Health Department (GLHD) 855 infants receiving formula 23.3 cans/month
 - Some babies breastfeed
- Water available in bottle form for powered formula through GLHD (the Diaper Bank)
- Water available for WIC clients only (keep this internal and not public)
- United Way giving away free filters and bottled water
- Elizabeth didn't know this program was going on-asked that information like this is communicated to her and Geralyn.
- SNAP benefits allow bottled water.

MDHHS PH Updates Response to Flint Lead Event

Oct. 1, 2015, 9:30 am

- It was mentioned that using SNAP benefits for bottled water would reduce clients amount they had for purchasing regular items.
- Elizabeth-has told Nick Lyon that she is not pushing for pre-made formula but pushing for filters for long term fix (for this short term).

C Local Public Health-Mark Miller

- Mt. Morris biggest area.
- Let Health Office know preliminary results tomorrow? Angela said we could give some stuff today but not data.

Response

D Communication

- Press Releases prepared for a generic lead prevention that is going out
- Lead Prevention Week-Oct. 25-Oct. 31 –more press releases, tool kit
- Can we distribute press releases through MALPH to local health departments?
- Conference Call today with DEQ and us
- Working on talking points-rapid turnaround for talking points
- How many children have been treated for lead poisoning in Flint? Nancy Peeler checked and 1 child since 2010 had a blood level greater than 45 and that was back in 2010.
- 1 on 1 with Detroit Free Press-we know for a fact that she will want a follow-up interview. Eden will handle-Reporter is a statistician-she will want to see analysis we did for Flint.
- Future-Detroit water testing most likely down the road-will go to DEQ-sampling done differently by them.
- IRB-Sent questions but haven't responded at all

E Testing

- Citizens calling in should be told to call their local health department or city
- No message yet for blood
- Could we pose that question to LHDs? Mark will
- Nancy Peeler-said testing is done for blood levels. Drs. need to write orders for the testing. Could Hurley or Motts be set up as testing sites? Do not prefer finger pricks-can get contaminated easily-comment from Nancy

F Filters

- DEQ did an interagency transfer of 1 million dollars to MDHHS for filters to our clients who get subsidies. Elizabeth said they are leaning towards vouchers. Reaching out to local retailers – coordinate human services piece. Need to make sure not duplicating what GLHD and United Way are doing. Kristen to look into it without letting them know what we are planning on doing.

G Investigations

- May have requests to do more-need to be prepared to do more-need a talking point
- Wesley Priem would have to test a Flint home-he works state wide and works a lot in Detroit this would take him away from this work.
- County lost its grant for lead abatement from hub a couple years ago.
- Eden to talk with HUD representative from Washington to see about getting some funds for Flint.

MDHHS PH Updates Response to Flint Lead Event
Oct. 1, 2015, 9:30 am

- From DEQ (internal use only) cost to run water 5 minutes: 3 to 16 cents.
- Breastfeeding-CLPP website-Nancy will do a talking point
- Comment from Eden-Breastfeeding Mom's need to know what they should do.

Angela needs talking points by noon ASAP is preferred

Nancy Peeler said that she has lead stick tests that she has for other areas and is researching transferring them to the Flint area.

Nancy also said that she believes she can redirect part of the MCH Block Grant money

Additional analyses are needed to better understand how results are received and processed in the data warehouse (we are finding true duplicates, duplicates reported on subsequent report dates, long interval between specimen date and report date, and we aren't finding as many children receiving follow-up testing as we would expect, but may need to lengthen our time frame to look for them).

Talking Points:

- Rates of positive lead tests (greater than or equal to 5 mcg/dl) vary over time partly due to small numbers and seasonal fluctuation.
- Shortly after the 2010 quarters rates were below the state 5 year average in most Flint zip codes.
- Beginning in Quarter 3 of 2014 rates increased in all Flint zip codes except 48507
- In Q1 2015 rates decreased, but begin rising and are highest in Q3 of 2015 in zip codes 48503 and 48504.
- Data for Q4 2015 is incomplete and based on tests drawn after October 1, with results reported to and processed in the MDHHS data warehouse. Data from this quarter should not be used for comparison until the quarter is complete.

	A	B	C	D	E	F	G	H	I	J	K
1											
2	NUMBER OF EBL										
3		May	June	July	August	September	October	November	December	January	February
4	2010-2011	NO DATA									
5	2011-2012	15	15	16	26	22	11	15	8	10	5
6	2012-2013	14	7	18	13	17	12	8	3	7	4
7	2013-2014	13	11	10	9	16	10	7	4	3	3
8	2014-2015	8	6	20	25	25	7	7	3	2	5
9											
10	TOTAL KIDS TESTED										
11		May	June	July	August	September	October	November	December	January	February
12	2010-2011	NO DATA									
13	2011-2012	474	393	332	513	520	420	379	249	343	303
14	2012-2013	328	338	383	550	464	417	332	246	328	303
15	2013-2014	380	363	385	404	438	427	310	283	313	325
16	2014-2015	356	329	386	452	480	361	283	224	305	287
17											
18											
19	EBL % BY MONTH										
20		May	June	July	August	September	October	November	December	January	February
21	2010-2011	NO DATA									
22	2011-2012	3.16%	3.82%	4.82%	5.07%	4.23%	2.62%	3.96%	3.21%	2.92%	1.65%
23	2012-2013	4.27%	2.07%	4.70%	2.36%	3.66%	2.88%	2.41%	1.22%	2.13%	1.32%
24	2013-2014	3.42%	3.03%	2.60%	2.23%	3.65%	2.34%	2.26%	1.41%	0.96%	0.92%

	L	M	N	
1				
2				
3	March	April	Total	
4				
5	7	4	154	
6	5	6	114	
7	6	5	97	
8	5	9	122	
9				
10				
11	March	April		
12				
13	399	375	4700	
14	328	402	4419	
15	371	346	4345	
16	348	339	4150	
17				
18				
19				
20	March	April	TOTAL EBL%	
21				
22	1.75%	1.07%	3.28%	
23	1.52%	1.49%	2.58%	
24	1.62%	1.45%	2.23%	

	A	B	C	D	E	F	G	H	I	J	K
25	2014-2015	2.25%	1.82%	5.18%	5.53%	5.21%	1.94%	2.47%	1.34%	0.66%	1.74%

	L	M	N
25	1.44%	2.65%	2.94%

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	NUMBER OF EBL											
3		May	June	July	August	September	October	November	December	January	February	March
4	2010-2011	22	16	14	27	29	11	14	1	6	17	9
5	2011-2012	15	15	16	26	22	11	15	8	10	5	7
6	2012-2013	14	7	19	14	17	13	8	4	7	4	5
7	2013-2014	12	11	10	9	16	9	7	4	3	3	6
8	2014-2015	8	6	20	25	25	7	7	4	2	5	5
9	2015	9	6	8	11							
10	TOTAL KIDS TESTED											
11		May	June	July	August	September	October	November	December	January	February	March
12	2010-2011	402	379	325	442	504	315	335	206	276	240	338
13	2011-2012	390	370	324	503	512	413	372	248	333	298	389
14	2012-2013	328	335	376	540	458	416	331	237	325	298	325
15	2013-2014	371	353	378	401	432	414	305	277	304	319	363
16	2014-2015	346	324	379	445	471	357	281	219	301	287	342
17	2015	297	330	249	284							
18												
19	EBL % BY MONTH											
20		May	June	July	August	September	October	November	December	January	February	March
21	2010-2011	5.47%	4.22%	4.31%	6.11%	5.75%	3.49%	4.18%	0.49%	2.17%	7.08%	2.66%
22	2011-2012	3.85%	4.05%	4.94%	5.17%	4.30%	2.66%	4.03%	3.23%	3.00%	1.68%	1.80%
23	2012-2013	4.27%	2.09%	5.05%	2.59%	3.71%	3.13%	2.42%	1.69%	2.15%	1.34%	1.54%
24	2013-2014	3.23%	3.12%	2.65%	2.24%	3.70%	2.17%	2.30%	1.44%	0.99%	0.94%	1.65%
25	2014-2015	2.31%	1.85%	5.28%	5.62%	5.31%	1.96%	2.49%	1.83%	0.66%	1.74%	1.46%

	M	N
1		
2		
3	April	Total
4	2	168
5	3	153
6	6	118
7	5	95
8	9	123
9		
10		
11	April	
12	285	4047
13	370	4522
14	397	4366
15	339	4256
16	337	4089
17		
18		
19		
20	April	TOTAL EBL%
21	0.70%	4.15%
22	0.81%	3.38%
23	1.51%	2.70%
24	1.47%	2.23%
25	2.67%	3.01%

	A	B	C	D	E	F	G	H	I	J	K	L
26	2015	3.03%	1.82%	3.21%	3.87%							

	M	N
26		

Message

From: Garcia, Deborah (DHHS) [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A1CC44FB10244EC99C28E57257FAC75D-GARCIA DEBORAH]
Sent: 12/17/2015 10:04:53 PM
To: Lyon, Nick (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cc8bf601f48844a2b44c7e1bda929e38-Lyon Nick]
CC: Grijalva, Nancy (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=16a1b77d7da74e3ba968074c67c5c8aa-Houts Nancy]; Rick, Matthew (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=72a2a08f22bb4209a513defa438bf5cc-Rick Matthew]; Waggoner, Carrie (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dc21e6f9ad1e4ed499564b6bf9823e16-Waggoner Carrie]
Subject: FOIA 2015-557 Marc Edwards - Flint Water Responsive Documents Part 4
Attachments: FOIA 2015-557 RedactedResponsiveDocs.zip
Importance: High

Nick,

See attached Part 4.

Debbie

Deborah R. Garcia, JD, MAHS

Public Health Administrative Law Specialist

Michigan Department of Health and Human Services

Office of Legal Affairs

Capitol View Building, 7th fl.

201 Townsend Street

Lansing, MI 48913

Direct Line: 517-241-3374

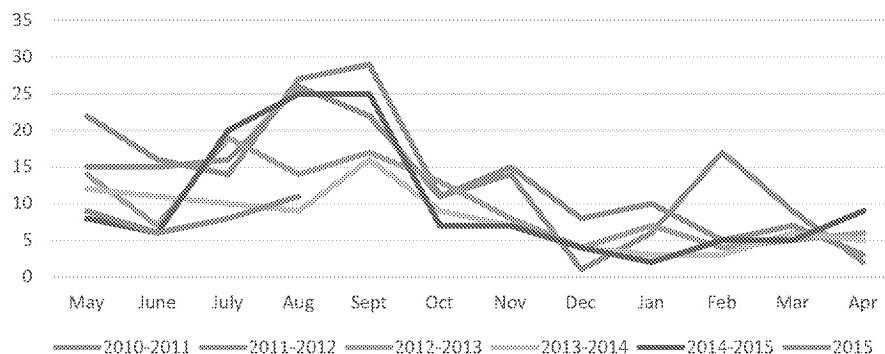
Fax: 517-241-1200

Garcia.d2@michigan.gov

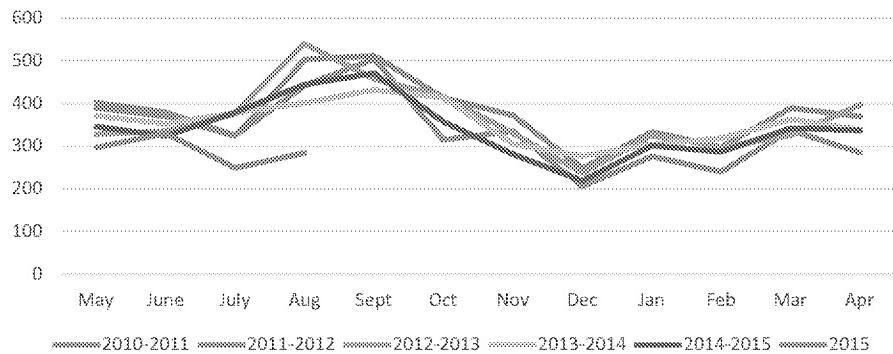
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**City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels***



**City of Flint, Children less than 16 years of age
Tested for Lead Poisoning**



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	22	16	14	27	29	11	14	1	6	17	9	2
2011-2012	15	15	16	26	22	11	15	8	10	5	7	3
2012-2013	14	7	19	14	17	13	8	4	7	4	5	6
2013-2014	12	11	10	9	16	9	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	4	2	5	5	9
2015	9	6	8	11								

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2012-2013	328	335	376	540	458	416	331	237	325	298	325	397
2013-2014	371	353	378	401	432	414	305	277	304	319	363	339
2014-2015	346	324	379	445	471	357	281	219	301	287	342	337
2015	297	330	249	284								

*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Less than 16 years of age at time of test

Includes only first-time blood lead levels $\geq 5 \text{ ug/dL}$

Includes sample type of venous, capillary or unknown

September 23, 2015

Source: MDHHS Data Warehouse, Lead Specimen table

From: Miller, Mark (DCH)
To: Dykema, Linda D. (DCH); Priem, Wesley F. (DCH)
Subject: FW: Childhood Lead Poisoning Prevention program documents
Date: Friday, September 25, 2015 1:54:55 PM
Attachments: Flint Testing and EBLLs updated 092315 with notes.pdf
Pediatric Lead Exposure Flint Water.from Hurley.pdf
Importance: High

FYI. Don't distribute too broadly!

From: Travis, Rashmi (DCH)
Sent: Friday, September 25, 2015 11:15 AM
To: Miller, Mark (DCH) <millerm1@michigan.gov>
Subject: FW: Childhood Lead Poisoning Prevention program documents
Importance: High

FYI the PPT from Hurley.

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 23, 2015 5:33 PM
To: Travis, Rashmi (DCH); Robinson, Mikelle (DCH); Lasher, Geralyn (DCH); Hertel, Elizabeth (DCH)
Cc: Fink, Brenda (DCH)
Subject: Childhood Lead Poisoning Prevention program documents
Importance: High

Hello – I'm going to send a series of emails with materials you have asked for, as a way to organize them.

The first document attached to this email is our CLPPP updated analysis of the blood lead testing data we have for children aged 0-16 in Flint. This is an update from what we sent to the Director's office earlier in the year, in that we added an additional year (2010-2011), and added data for May-August 2015 (per Geralyn's request in an email late last week).

Regarding this data:

- We are using the timeframe of May –April for this chart, because the water source change in Flint happened in April 2014. So, we started by looking at the 12 month time period from May 2014 – April 2015. Then we went back and compared that same time frame to the 4 previous years, to see if the pattern was similar, significantly different, etc.
- We included all children with a Flint address, which may not exactly conform to the city boundaries.
- We only included first time blood lead levels of ≥ 5 mcg/dL, not all subsequent tests a child may have received.
- We included all types of blood samples – venous blood draws, capillary samples, or unknown (e.g. not labeled as venous or capillary). Typically we would point to venous samples as the best, most reliable, but we had many non-venous samples, so to be inclusive added those in.

Looking at the charts, you can definitely see the seasonal impact associated with lead poisoning.

We do NOT see a different pattern of results for the 2014-2015 year, right after the change in water source. That year looks more like the data from 10-11, and 11-12.

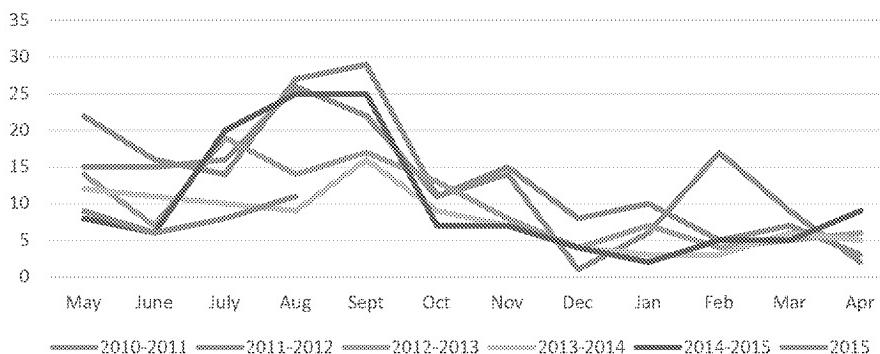
For the full 5 years worth of data, testing rates were pretty consistent, so we don't think that is driving the data. However, note that testing levels for May-August 2015 appear to be lower than in the previous 5 years.

The second document I have attached is a presentation sent to us this morning by Dr. Mona Hanna-Attisha, from Hurley Medical Center. She shared this related to her data request that she sent to our program. In scanning it, we noted that she is using different data than we did (by age, by zip code, time frames, which years she included, etc.), so comparing our data chart to her results is like comparing apples and oranges. We have not run any analyses using her parameters. We did note some slides in her document that we might disagree with, for example her statement that water is the primary source of lead (in Michigan, it remains lead paint that is our primary source of lead exposure).

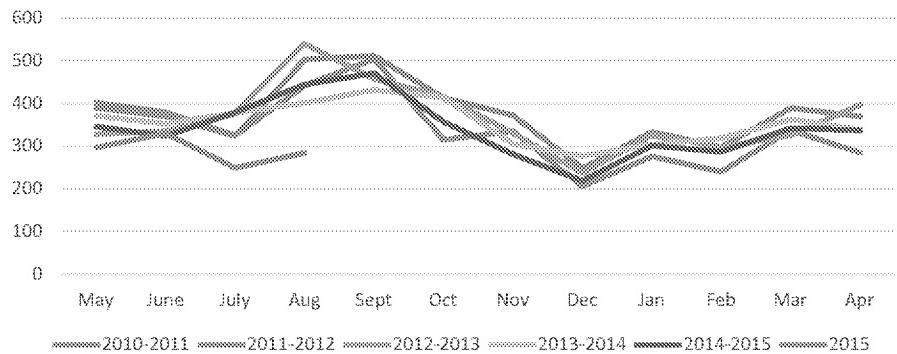
Please let us know if you have questions you have about the data charts we produced. Next email will be some of our program materials, that may be of use in the upcoming outreach effort. Also, Rashmi indicated who I should include on this email, and I trust you will share with others as appropriate.

Nancy

**City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels***



**City of Flint, Children less than 16 years of age
Tested for Lead Poisoning**



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2013-2014	12	11	10	9	16	9	7	4	3	3	6	5
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*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Less than 16 years of age at time of test

Includes only first-time blood lead levels $\geq 5 \text{ ug/dL}$

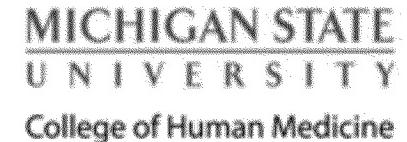
Includes sample type of venous, capillary or unknown

September 23, 2015

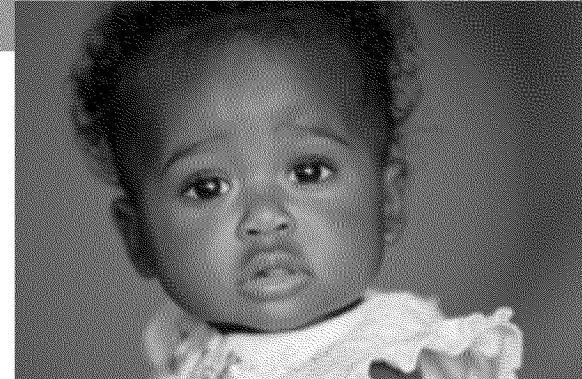
Source: MDHHS Data Warehouse, Lead Specimen table

PEDIATRIC LEAD EXPOSURE IN FLINT, MICHIGAN: A FAILURE OF PRIMARY PREVENTION

Mona Hanna-Attisha MD MPH FAAP
Hurley Children's Hospital
Michigan State University Department of
Pediatrics and Human Development



Introducing Makayla*



- 12 month old girl (DOB 8/15/2014) presented last week for her 1 year old check up. No concerns.
- Lives with single mom and 2 older siblings in west side (48504). Formula from WIC; powder mixed with warm tap water.
- Physical exam and development are normal. Makayla receives her 1 year old vaccines and routine lead and hemoglobin screening.
- *A couple days later, lead level comes back as 6 ug/dL.*

*Hypothetical scenario

Blood lead level of 6 ug/dL....

- Blood lead levels (BLL) above 5 ug/dL are considered elevated blood lead levels (EBL)
- Just a few years ago (2012), 10 ug/dL was cutoff
- Increasing evidence shows NO safe blood lead level
- Disproportionately impacts low income, minority children
- Primary prevention is most important

Primary Prevention

- “Because no measurable level of blood lead is known to be without deleterious effects, and because once engendered, the effects appear to be irreversible in the absence of any other interventions, public health, environmental and housing policies should encourage PREVENTION of all exposure to lead.”

“Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention.”
2012 CDC Advisory Committee on Childhood Lead Poisoning Prevention.

What will happen to Makayla?

- Vast evidence supports increased likelihood of:
 - Decrease in IQ
 - An increase in BLL from 1 to 4 ug/dL, drops mean IQ -3.7 points
 - Small change in mean IQ, shifts entire population IQ distribution
 - Reduces high achievers IQs (>130) and increases kids with low IQs (<70)
 - Implications for special education services, employment, incarceration, life achievement, etc

Lanphear BP et al., Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. Environ Health Perspect, 2005. 113:894-9.

Fewtrell LJ, Pruss-Ustun A, Landrigan P, and Ayuso-Mateos JL, Estimating the global burden of disease of mild mental retardation and cardiovascular diseases from environmental lead exposure. Environmental Research, 2004. 94:120-33.

Behavioral Burden

- Increased likelihood of :
 - ADHD behaviors
 - Delinquent behaviors and arrests
 - Total arrests and increased rates of arrests involving violent offenses
- Other health effects: hematologic, cardiovascular, immunologic, endocrine, etc

Wright, JP, KN Dietrich, MD Ris, et al. 2008. Association of prenatal and childhood blood lead concentrations with criminal arrests in early adulthood. *PLoS Med* 5(5): e101

Chen, A, B Cai, KN Dietrich, et al. 2007. Lead exposure, IQ, and behavior in urban 5-7 year-olds: Does lead affect behavior only by lowering IQ? *Pediatrics* 119(3): e650-e658.

Needleman, HL, C McFarland, RB Ness, et al. 2002. Bone lead levels in adjudicated delinquents: A case control study. *Neurotoxicology and Teratology* 24(6):711-717.

The Cost

- “For childhood lead poisoning, \$5.9 million in medical care costs, as well as an additional \$50.9 billion (sensitivity analysis: \$44.8–\$60.6 billion) in lost economic productivity resulting from reduced cognitive potential from preventable childhood lead exposure.”
- “The present value of Michigan’s economic losses attributable to lead exposure in the 2009 cohort of 5 year-olds ranges from \$3.19 (using U.S. blood lead levels) to \$4.85 billion (using Michigan blood lead levels) per year in loss of future lifetime earnings.”

Leonardo Trasande and Yinghua Liu. Reducing The Staggering Costs Of Environmental Disease In Children, Estimated At \$76.6 Billion In 2008. *Health Affairs*, 30, no.5 (2011):863-870

The Price of Pollution: Cost Estimates of Environment-Related Childhood Diseases in Michigan. 2010 Report by Michigan Network of Children’s Environmental Health

Lead in Water

- Increasing as source of lead, because of success in controlling other sources.
- Increasing due to aging water infrastructures, change in water sources, disinfectant uses, etc
- Disproportionally impacts developmentally-vulnerable formula-fed infants and pregnant mothers
 - For about 25% of infants drinking formula made from tap water at 10 ppb, blood lead would rise above the CDC level of concern of 5 micrograms/deciliter (or ug/dL).
 - Increase in fetal death and reduced birth weights

Triantafyllidou, S., Gallagher, D. and Edwards, M. Assessing risk with increasingly stringent public health goals: the case of water lead and blood lead in children. *Journal of Water and Health*. doi: 10.2166/wh.2013.067 58-68 (2014).

Edwards, M. Fetal Death and Reduced Birth Rates Associated with Exposure to Lead-Contaminated Drinking Water. *Env. Sci. and Tech.* 2013 DOI: 10.1021/es4034952

PRELIMINARY RESULTS

Preliminary Results of Pediatric Blood Lead Levels (BLL)

• Methods

- Data from all blood lead levels processed at Hurley Medical Center
- HMC Institutional Review Board (IRB) approved
- All children 5 years of age and younger
- Zip codes 48501-48507
- Two periods of comparison:
 - PRE-SWITCH: January 1, 2013 – September 15, 2013
 - POST-SWITCH: January 1, 2015 – September 15, 2015
- Analyzed % Elevated Blood Lead (EBL)
 - EBL = Blood lead Levels > 5 g/dL

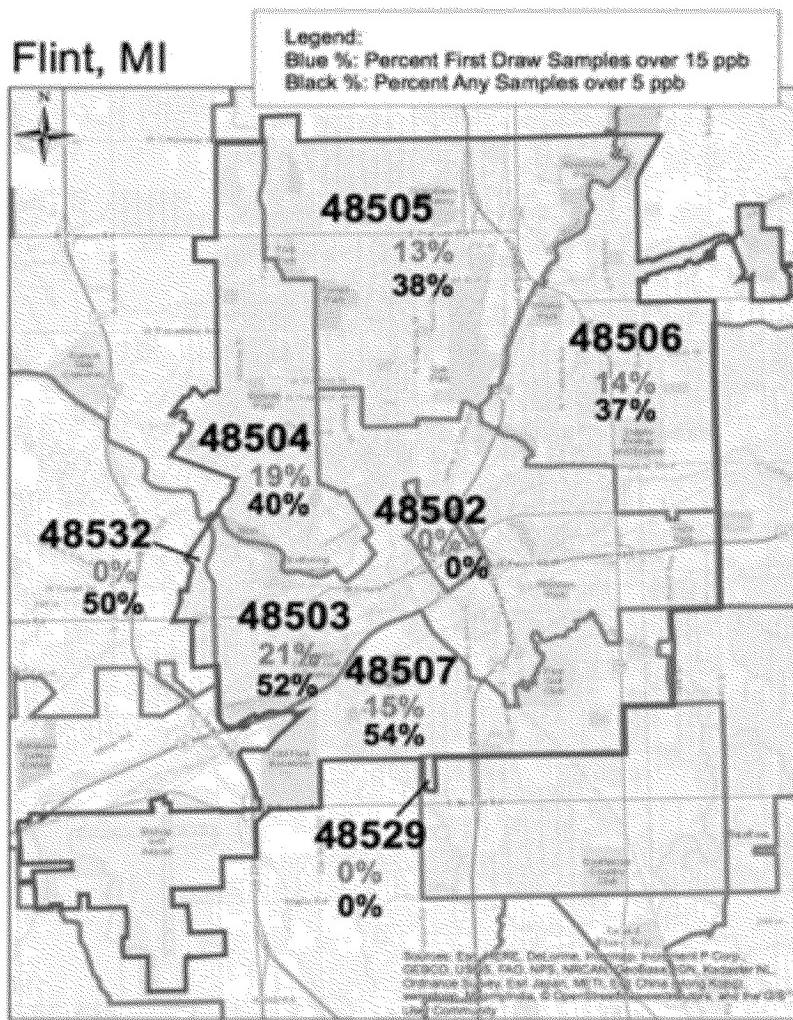
Blood Lead Level Analysis

- Large sample size
 - N= 1746 for Flint children (pre n=906, post n=840)
 - N= 1670 for non-Flint children (pre n=943, post n=727)

Flint results for children 5 years and under:

- PRE-SWITCH % EBL: 2.1% (consistent with MDHHS data 2.2)
- POST-SWITCH % EBL: 4.0%
- p < 0.05; STATISTICALLY SIGNIFICANT CHANGE

High Risk Zip Codes Results



- Focus on zip codes (48503 and 48504) with high water lead levels
 - Total n=742, pre n=394, post n=348
 - Results:
 - PRE-SWITCH % EBL: 2.5%
 - POST-SWITCH % EBL: 6.3%
 - p < 0.05; STATISTICALLY SIGNIFICANT CHANGE

What was rest of county doing?

- Analysis of same time periods for Genesee County children who live outside of City of Flint zip codes (non 48501-48507)
 - N=1670 for non-Flint children (pre n=943, post n=727)

Non-Flint results for children 5 years and under:

- PRE-SWITCH % EBL: 0.6%
- POST-SWITCH % EBL: 1.0%
- $p = 0.637$; NO CHANGE

Blood Lead Level Analysis

- % EBL all children less than 5 years of age

	ALL FLINT (n=1746)	HIGH- RISK FLINT (n=742)	REST OF FLINT (n=1004)	NON- FLINT (n=1670)
PRE-SWITCH	2.1%	2.5%	1.8%	0.6%
POST-SWITCH	4.0%	6.3%	2.4%	1.0%

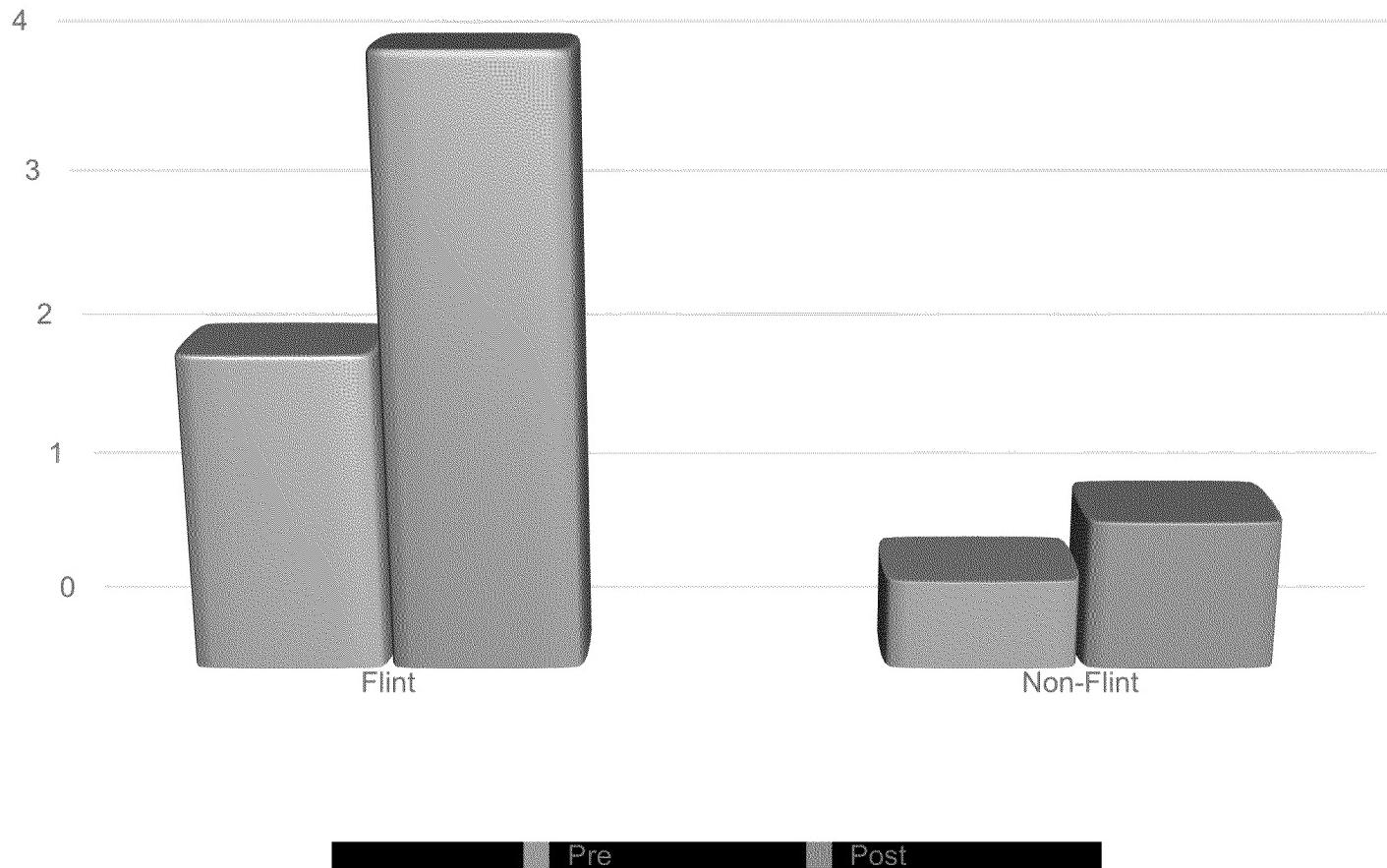
Blood Lead Level Analysis

- % EBL children 15 months or less
 - Total Flint n=619, pre n=295, post n=324
 - Total Non-Flint n=816, pre n=443, post n=376

	HIGH-RISK FLINT (n=269)	REST OF FLINT (n=350)	NON-FLINT (n=816)
PRE-SWITCH	1.5%	0.6%	0.5%
POST-SWITCH	4.4%	1.1%	0.5%

Graphical Summary

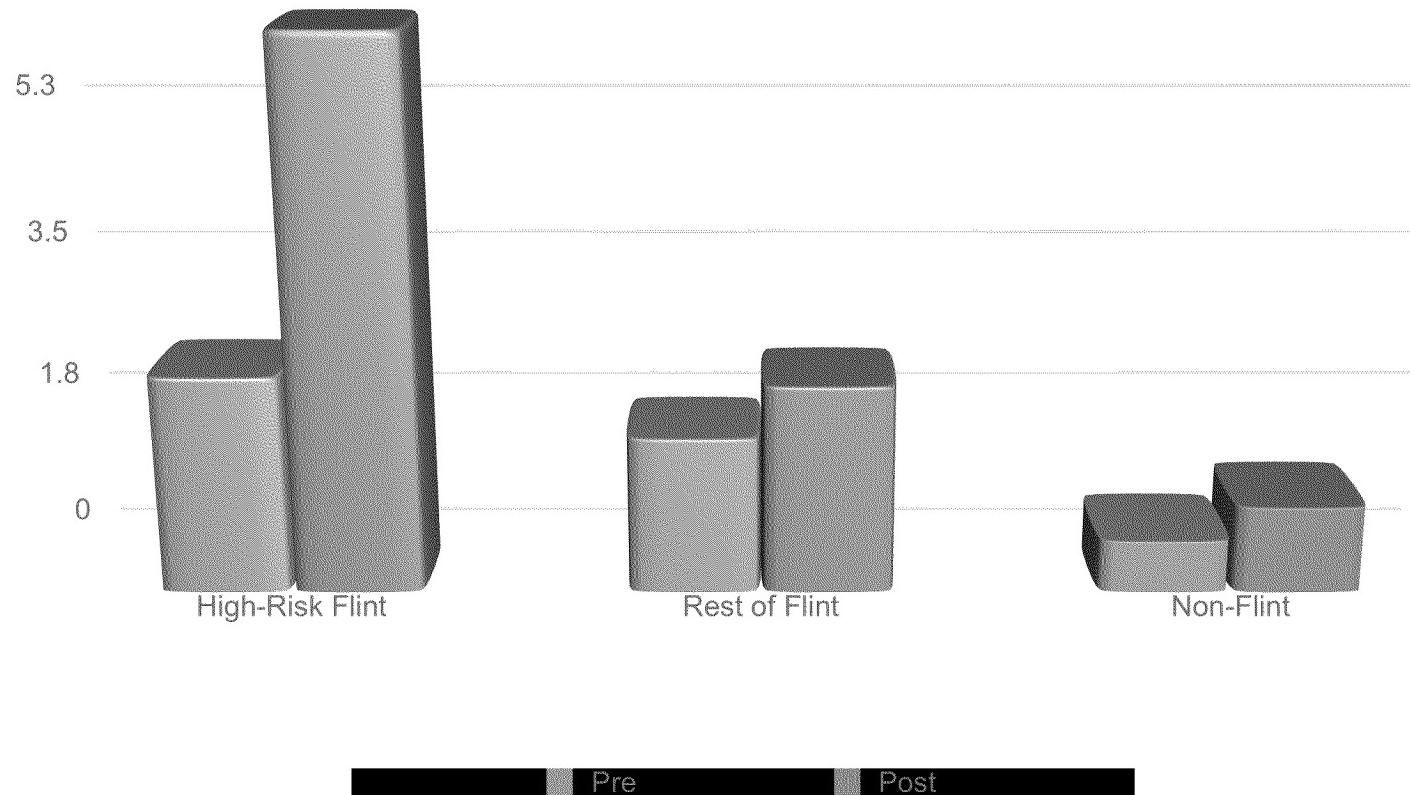
Change in % EBL Flint vs Non-Flint



Graphical Summary

Change in % EBL by area

7



Conclusions from BLL analysis

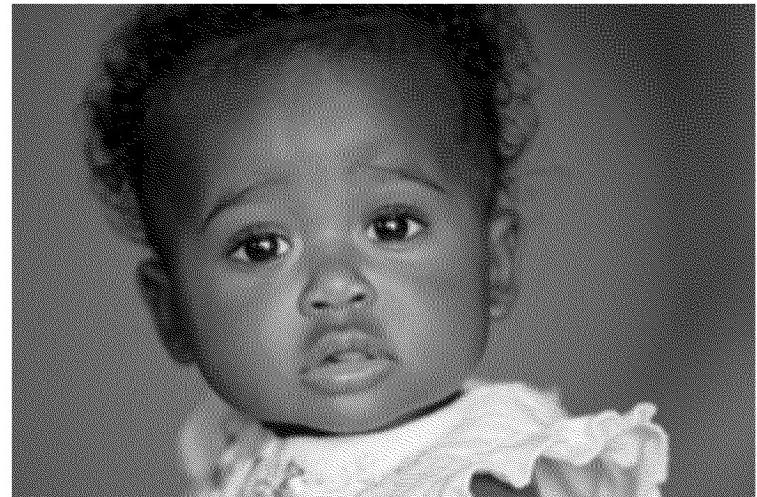
- % of children with EBL in Flint has increased
 - Most striking increase in zip codes with highest water lead levels
- Results underestimate risk: infants not screened for lead and water usage unknown.
 - *Accurate exposure largely unknown since national childhood lead screening focuses on household lead exposure (paint, soil, dust) at later ages (1 and 2 yrs)*
- Results are consistent and concerning. Primary prevention has failed.

Next Steps

- Immediately limit further exposure
 - Encourage breast feeding
 - No tap water for high risk groups: infants on formula & pregnant mothers
 - Declare health advisory: allows WIC to administer water or ready-to-feed formula and other resources (Salvation Army & United Way water supplies)
 - Distribution of lead clearing NSF-approved filters
 - Public education regarding precautions (flushing, etc)
 - Re-connect to Lake Huron water source ASAP

And Makayla...

- Asymptomatic now
- But what will her future hold and an entire generation of Flint children?



WATER SAMPLING KIT FOR LEAD

Read these instructions the day before filling bottles!

Step 0. Plan ahead. It is **very** important to collect water **after allowing it to sit in your pipe for at least 6 hours**. To do so easily, water should be collected **first thing in the morning** (after no one uses the water overnight).

Step 1. After the water was not used for at least 6 hours, open the kit and remove the plastic caps from all three bottles.

Step 2. With the largest bottle #1 (1 liter) held under the kitchen or bathroom tap, open the cold water tap and fill the bottle at high flow (as if you were filling a pitcher of water). Place the filled large bottle on the counter while letting water continue to flow normally.

Step 3. Let water run for 45 seconds after the first bottle was filled, and then place the medium size bottle #2 under the faucet to catch the water and fill the bottle. Put the filled medium size bottle on the counter while allowing the water to continue to flow.

Step 4. Let the water run for another 2 minutes after the second bottle was filled, and then place the smallest bottle #3 under the faucet to catch the water and fill the bottle. Put the small size bottle on the counter.

Step 5. Turn off the flow, put caps on each bottle, and firmly tighten the caps.

Step 6. Place the bottles into the zip-lock bag that is provided. Seal the zip lock bag and place the bag (with bottles inside) into the box that is provided (see picture).

Step 7. Fill out the information below, so that we can mail you the results after we analyze the samples for lead.

Name: _____

Address: _____

City/State/Zip: _____

E-mail: _____

Phone: _____

Date Sample Collected: _____

Year House Constructed (if known): _____ Do you use a water softener or a filter? _____

Step 8. Put this sheet into the box, tape the box shut and then return it to your collection point so it can be shipped to Virginia Tech.

Call Jeff Parks at 540-392-4781 if you have any questions regarding these instructions.



Lead in City of Flint Drinking Water Briefing Document

**Prepared by
Dr. Linda D Dykema**

The purpose of the city of Flint water sampling is to determine compliance with the drinking water regulations for lead.

- There is no health-based Maximum Contaminant Level (MCL) for lead.
- Lead enters drinking water in the distribution system from corrosion of lead-containing supply lines or plumbing fixtures in a home.
- EPA & DEQ rely on a “treatment approach” to reduce exposures to lead in drinking water.
- The “action level” for lead in drinking water is 15 parts per billion (ppb).
- This is a level the EPA considers attainable by such measures as adjusting the physical characteristics of the water (pH, hardness) that affect the corrosivity of the water.
- The compliance point for lead is the tap water in the homes.
- Water suppliers randomly select homes to be sampled and focus on areas with lead service lines.
- A tap water sample is collected by the resident from a frequently used cold water faucet. DEQ instructs residents to flush the faucet for 5 minutes, then not use it at all for at least 6 hours (but not more than 12) after which the residents collects a first draw sample.
- The first draw sample represents the water that has been motionless (or stagnant) in the home’s plumbing for 6-12 hours.
- If more than 10% of the samples collected during any monitoring period is greater than 15 ppb the drinking water system is out of compliance.
- Compliance monitoring is not intended to represent or evaluate human intake of lead.

The purpose of the water sampling conducted by the Virginia Tech Flint Water Study was to characterize lead levels in drinking water in the city of Flint to which people are exposed.

- VA Tech researchers recruited volunteer participants and attempted to sample all areas of the city.
- Tap water samples were collected by the resident from a kitchen or bathroom cold-water faucet.
- Residents were instructed not to use the faucet for at least 6 hours (no pre-flush) then collect 3 samples:
 - a first draw sample, which represents the water that has been motionless (or stagnant) in the home’s plumbing for at least 6 hours,
 - a second sample letting the tap run for 45 seconds after filling the 1st bottle, which represents water from the service line proximal to the home, and
 - a third sample letting the tap run for 2 minutes after filling the #2 bottle, which presumably represents water from the service line at a greater distance from the home.
- The visual graphic representations of the VA Tech data are attached.
- First draw samples exceeded 15 ppb in zip codes 48503 (20% of 69), 48504 (18% of 55), 48505 (13% of 48), 48506 (16% of 44), and 48507 (16% of 51).
- Second and third sample results appear to have exceeded 15 ppb as well, but exact percentages cannot be determined from the graphic representations of the data.
- Too few samples were collected from zip codes 48502, 48529, and 48532 to draw conclusions.
- **The protocol used by the VA Tech researchers and their results appear to be consistent with their intent to characterize lead levels in drinking water in the city of Flint.**

Blood Lead Levels in Flint Talking Points

October 1, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley;
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - there is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 49503 and 49504. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
- We reviewed MDHHS statewide data using the same methodology used by Hurley, looking at our numbers by zip code and age ranges, and filtering out non-Flint children.
- Routine surveillance of blood lead levels does not analyze data down to the zip code level. Detailed analysis like this occurs when there is reason to focus in on precise locations or populations.
- MDHHS will be working closely with the Michigan Department of Environmental Quality, Hurley Children's Hospital, the Genesee County Health Department, and community organizations to initiate further action steps.

- We understand that cost may be a barrier to following the recommendations of the local health department. We are actively working with public and private partners to make resources available to those who may need assistance.
- MDHHS is recommending that residents follow the Public Health Advisory issued by the Genesee County Health Department, as well as take further steps to reduce exposures to all forms of lead in and around their homes.

MDHHS Stats and Facts

- Data charts/breakdowns and explanations--
- Lead abatement through MDHHS was federally funded up until FY14 when Michigan began providing additional funds to abate homes.
- In FY14, \$1.25M General Fund was added. In FY15, General Fund was bumped up to \$1.75M and FY16, General Fund remains at \$1.75M.

Reducing and Removing Lead Exposure

- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
- Make sure your child does not have access to peeling paint or chewable surfaces painted with lead-based paint.
- Children and pregnant women should not be present in housing built before 1978 that is undergoing renovation. They should not participate in activities that disturb old paint or in cleaning up paint debris after work is completed.
- Create barriers between living/play areas and lead sources. Until environmental clean-up is completed, you should clean and isolate all sources of lead.
 - Close and lock doors to keep children away from chipping or peeling paint on walls. You can also apply temporary barriers such as contact paper or duct tape, to cover holes in walls or to block children's access to other sources of lead.
- Regularly wash children's hands and toys. Hands and toys can become contaminated from household dust or exterior soil. Both are known lead sources.
- Regularly wet-mop floors and wet-wipe window components. Because household dust is a major source of lead, you should wet-mop floors and wet-wipe horizontal surfaces every 2-3 weeks.
 - Windowsills and wells can contain high levels of leaded dust. They should be kept clean. If feasible, windows should be shut to prevent abrasion of painted surfaces or opened from the top sash.
- Take off shoes when entering the house to prevent bringing lead-contaminated soil in from outside.

- Prevent children from playing in bare soil; if possible, provide them with sandboxes. Plant grass on areas of bare soil or cover the soil with grass seed, mulch, or wood chips, if possible.
 - Until the bare soil is covered, move play areas away from bare soil and away from the sides of the house. If you have a sandbox, cover the box when not in use to prevent cats from using it as a litter box. That will help protect children from exposure to animal waste.
- Avoid using makeup, containers, cookware, or tableware to store or cook foods or liquids that are not shown to be lead free.
- Remove recalled toys and toy jewelry immediately from children.
- Use only cold water from the tap for drinking, cooking, and making baby formula. Hot water is more likely to contain higher levels of lead. Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.
- Shower and change clothes after finishing a task that involves working with lead-based products such as stained glass, making bullets, or using a firing range.

WIC Children

- There are 855 infants participating in WIC in Flint
- In homes with infants on WIC, if the household has documentation from an official source of unsanitary water supply issues, that family may be eligible to receive ready-to-feed formula. Families should contact WIC to see if they are eligible.
- Each household would have to be looked at on an individual basis.
- WIC cannot cover bottled water.

Background

- The results of the Hurley Children's Hospital were reviewed by MDHHS after the study was released last week.
- The analysis that Hurley conducted was different from the initial MDHHS data regarding blood lead levels in Flint.
- MDHHS initial data looked at the entire blood lead levels for the Flint area for the past five years and showed the annual seasonal trends in the area.
- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. Further, seasonal variations in water can occur due to changes in temperature, pH , and other factors

Blood Lead Levels in Flint Talking Points

October 5, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley.
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - There is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 03 and 04. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
- We reviewed MDHHS statewide data using the same methodology used by Hurley, looking at our numbers by zip code and age ranges, and filtering out non-Flint children.
- Routine surveillance of blood lead levels does not analyze data down to the zip code level. Detailed analysis like this occurs when there is reason to focus in on precise locations or populations.
- MDHHS will be working closely with the Michigan Department of Environmental Quality, Hurley Children's Hospital, the Genesee County Health Department, and community organizations to initiate further action steps.
- We understand that cost may be a barrier to following the recommendations of the local health department. We are actively working with public and private partners to make resources available to those who may need assistance.

- MDHHS is recommending that residents follow the Public Health Advisory issued by the Genesee County Health Department, as well as take further steps to reduce exposures to all forms of lead in and around their homes.

MDHHS Stats and Facts

- ‘High Risk’ Zip codes (48503 and 48504)
 - Blood lead level rates among children under six years of age in the high risk zip codes (48503, 48504) were 2.7 times higher than the rest of Genesee County before the switch to Flint River Water.
 - After the switch to Flint River Water, rates in the high risk Zip codes were 3.2 times that of the rest of Genesee County.
- Other Zip codes in Flint
 - Rates of elevated blood lead levels among children under six years of age in other parts of the city of Flint were 2 times that of the rest of Genesee County before the switch to Flint River Water.
 - The magnitude of the elevated rate remained roughly the same during the period after the water source switch.
- Lead abatement through MDHHS was federally funded up until FY14 when Michigan began providing additional funds to abate homes.
- In FY14, \$1.25M General Fund was added. In FY15, General Fund was bumped up to \$1.75M and FY16, General Fund remains at \$1.75M.

Water Filters

- Our first action item is to work closely with our public and private partners to provide water filters to Flint residents and MDHHS clients.
- To meet this priority, the governor identified one million dollars in state funding to purchase water filters for Flint residents.
- Free water filters are available to current Michigan Department of Health and Human Services clients and Flint residents at four locations:
 - Flint residents who are not current MDHHS clients should visit one of two Genesee County Community Action Resource Department offices to obtain a filter.
 - at 2727 Lippincott and 601 North Saginaw in Flint
 - Current MDHHS clients in the city of Flint should visit their local MDHHS office
 - At 125 E. Union St. or 4809 Clio Road
- Staff will be onsite at all four locations from 9 a.m. to 4 p.m., Monday through Friday, to distribute filters and assist residents who have questions about proper installation.

- Given the questions and concerns regarding the change in water source in Flint, MDHHS authorized the use of emergency services funding to provide water filters for MDHHS clients receiving assistance in the city of Flint.
- This funding will support active Family Independence Program (FIP), Food Assistance Program (FAP), Child Development and Care (CDC), State Disability Assistance (SDA), State Disability Assistance (SDA), or Social Security Insurance (SSI) recipients so that they can obtain filters that are National Sanitation Foundation (NSF) certified to remove lead and ANSI Standard 53.
- MDHHS currently serves approximately 25,000 households in Flint.

Reducing and Removing Lead Exposure

- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
- Make sure your child does not have access to peeling paint or chewable surfaces painted with lead-based paint.
- Children and pregnant women should not be present in housing built before 1978 that is undergoing renovation. They should not participate in activities that disturb old paint or in cleaning up paint debris after work is completed.
- Create barriers between living/play areas and lead sources. Until environmental clean-up is completed, you should clean and isolate all sources of lead.
 - Close and lock doors to keep children away from chipping or peeling paint on walls. You can also apply temporary barriers such as contact paper or duct tape, to cover holes in walls or to block children's access to other sources of lead.
- Regularly wash children's hands and toys. Hands and toys can become contaminated from household dust or exterior soil. Both are known lead sources.
- Regularly wet-mop floors and wet-wipe window components. Because household dust is a major source of lead, you should wet-mop floors and wet-wipe horizontal surfaces every 2-3 weeks.
 - Windowsills and wells can contain high levels of leaded dust. They should be kept clean. If feasible, windows should be shut to prevent abrasion of painted surfaces or opened from the top sash.
- Take off shoes when entering the house to prevent bringing lead-contaminated soil in from outside.
- Prevent children from playing in bare soil; if possible, provide them with sandboxes. Plant grass on areas of bare soil or cover the soil with grass seed, mulch, or wood chips, if possible.
 - Until the bare soil is covered, move play areas away from bare soil and away from the sides of the house. If you have a sandbox, cover the box when not in

use to prevent cats from using it as a litter box. That will help protect children from exposure to animal waste.

- Avoid using makeup, containers, cookware, or tableware to store or cook foods or liquids that are not shown to be lead free.
- Remove recalled toys and toy jewelry immediately from children.
- Use only cold water from the tap for drinking, cooking, and making baby formula. Hot water is more likely to contain higher levels of lead. Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.
- Shower and change clothes after finishing a task that involves working with lead-based products such as stained glass, making bullets, or using a firing range.

WIC Children

- There are 855 infants participating in WIC in Flint.
- We are working with partners at the United Way to ensure that WIC families have access to water filters and bottled water.
- In homes with infants on WIC, if the household has documentation from an official source of unsanitary water supply issues, that family may be eligible to receive ready-to-feed formula. Families should contact WIC to see if they are eligible.
- Each household would have to be looked at on an individual basis.
- WIC cannot cover bottled water.

Background

- The results of the Hurley Children's Hospital were reviewed by MDHHS after the study was released last week.
- The analysis that Hurley conducted was different from the initial MDHHS data regarding blood lead levels in Flint.
- MDHHS initial data looked at the entire blood lead levels for the Flint area for the past five years and showed the annual seasonal trends in the area.
- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. Further, seasonal variations in water can occur due to changes in temperature, pH , and other factors

From: Miller, Corinne (DHHS)
To: Dykema, Linda D. (DHHS); LyonCallo, Sarah (DHHS); Priem, Wesley F. (DHHS); Wells, Eden (DHHS)
Subject: RE: Talking Points
Date: Thursday, October 01, 2015 2:18:30 PM

Eden,

More analysis and review has been done by Sarah's staff. Here are the talking points:

The high risk Zip codes (48503 and 48504)

Blood lead level rates among children under six years of age in the high risk Zip codes (48503, 48504) were 2.7 times higher than the rest of Genesee County before the switch to Flint River Water ($p<0.0001$). After the switch to Flint River Water, rates in the high risk Zip codes were 3.2 times that of the rest of Genesee County ($p<0.0001$).

Thus, compared to rates during 2010-2013, the rates after the switch to Flint River water in the high risk Zip codes increased 18 percent, although this difference did not reach statistical significance.

Other Zip codes in Flint

Rates of elevated blood lead levels among children under six years of age in other parts of the city of Flint were 2 times that of the rest of Genesee County before the switch to Flint River Water ($p<0.0001$). The magnitude of the elevated rate remained roughly the same during the period after the water source switch.

From: Dykema, Linda D. (DHHS)
Sent: Thursday, October 01, 2015 1:06 PM
To: Miller, Corinne (DHHS); LyonCallo, Sarah (DHHS); Priem, Wesley F. (DHHS); Wells, Eden (DHHS)
Subject: RE: Talking Points
Importance: High

2 things:

- Leaded gasoline has been banned for use in road vehicles since 1996, so it's not likely that Flint kids would be exposed that way
 - The sentence "Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply" is not completely accurate and could be challenged. On the call with EPA today I heard that maybe 50% of the city's lead supply lines are lead...these are outside the house and would include the portion of the run owned by the resident and the portion owned by the city water supply.
-

From: Miller, Corinne (DHHS)
Sent: Thursday, October 01, 2015 12:38 PM
To: LyonCallo, Sarah (DHHS); Dykema, Linda D. (DHHS); Priem, Wesley F. (DHHS)
Subject: Fwd: Talking Points

Sent from my iPhone

Begin forwarded message:

From: "Eisner, Jennifer (DHHS)" <EisnerJ@michigan.gov>
Date: October 1, 2015 at 11:51:51 AM EDT
To: "Miller, Corinne (DHHS)" <MillerC39@michigan.gov>, "Robinson, Mikelle (DHHS)" <RobinsonM18@michigan.gov>
Cc: "Wells, Eden (DHHS)" <WellsE3@michigan.gov>

Subject: Talking Points

Corinne and Mikelle:

Attached please find the most recent Flint talking points which include edits from Dr. Wells. A 12:30 meeting with the gov's comms team was just called, so we need to have them finalized and ready to share asap.

Can you please send me the bullet points explaining the data – or what is ready of them – by noon?

Thank you,

Jennifer (Smith) Eisner

Public Information Officer

Michigan Department of Health and Human Services

517-241-2112

From: [Moran, Susan \(DCH\)](#)
To: [Lasher, Geralyn \(DCH\)](#)
Cc: [Peeler, Nancy \(DCH\)](#); [Robinson, Mikelle \(DCH\)](#); [Wells, Eden \(DCH\)](#); [Minicuci, Angela \(DCH\)](#); [Hertel, Elizabeth \(DCH\)](#); [Eisner, Jennifer \(DCH\)](#); [Dykema, Linda D. \(DCH\)](#); [Miller, Corinne \(DCH\)](#)
Subject: Re: State data confirms higher blood-lead levels in Flint kids
Date: Sunday, September 27, 2015 5:04:24 PM

Copying Corrine and Lynda Dykema.

Sent from my iPhone

> On Sep 27, 2015, at 2:11 PM, Lasher, Geralyn (DCH) <lasherg@michigan.gov> wrote:
>
> We will need help responding to what the Free Press is claiming in this article.
>
> Sue--let us know who can get us this as early Monday as possible.
>
> State data confirms higher blood-lead levels in Flint kids
>
> <http://www.freep.com/story/opinion/columnists/nancy-kaffer/2015/09/26/state-data-flint-lead/72820798/>
>
>
> Sent from my iPad

From: [Moran, Susan \(DCH\)](#)
To: [Lyon, Nick \(DCH\)](#)
Cc: [Robinson, Mikelle \(DCH\)](#); [Wells, Eden \(ewells@umich.edu\)](#); [Hertel, Elizabeth \(DCH\)](#); [Lasher, Geralyn \(DCH\)](#); [Grijalva, Nancy \(DCH\)](#); [Becker, Timothy \(DCH\)](#); [Dykema, Linda D. \(DCH\)](#); [Miller, Corinne \(DCH\)](#); [Anderson, Paula \(DCH\)](#)
Subject: Re: Proposed Press Conference on Flint Drinking Water
Date: Monday, September 28, 2015 10:09:05 AM

Lynda Dykema is the contact for questions on Virginia Tech/Hurley data.

Sent from my iPhone

On Sep 28, 2015, at 7:52 AM, Lyon, Nick (DCH) <LyonN2@michigan.gov> wrote:

Director Wyant and I agreed this morning to establish a team to look at the recommendations below in preparation for a joint press conference later this week. I did modify one and remove one from his original email. He was suggesting an outside public health advisor. I think it's appropriate that this be our CME so I changed that piece. I volunteered Geralyn, Elizabeth, and Dr. Wells to serve on the team.

The areas where we need more attention are as follows:

<!--[if !supportLists]-->1) <!--[endif]-->I need an analysis of the Virginia Tech/Hurley data and their conclusions. I would like to make a strong statement with a demonstration of proof that the lead blood levels seen are not out of the ordinary and are attributable to seasonal fluctuations. Geralyn is working on this for me but she needs someone in public health who can work directly with her on immediate concerns/questions. Sue – Please get her a name immediately.
<!--[if !supportLists]-->2) <!--[endif]-->I need an understanding of what WIC will pay for and when. We are hearing that the USDA is indicating that premade formula can be provided. Internal WIC staff don't seem to be saying the same things. And there may also be a supply issue. Elizabeth is following up for me on this.
<!--[if !supportLists]-->3) <!--[endif]-->Elizabeth will also follow up with Terry Beuer to see what FNS will pay for on the food assistance side, or if there are other programs that may cover water or premade formula.
<!--[if !supportLists]-->4) <!--[endif]-->I think we did a good job getting the local public health department involved and I ask that we work in concert with him. The recommendation is that they be included in the press event this week.

We need immediate action on these. I have a follow up phone call early this afternoon. I also ask that any requests coming from the team be treated with great urgency. The expectation is that we will get on top of this and provide leadership on the issue.

Nick

From: Wyant, Dan (DEQ)
Sent: Monday, September 28, 2015 7:18 AM
To: Muchmore, Dennis (GOV); Lyon, Nick (DCH); Hollins, Harvey (GOV)
Cc: Wurfel, Sara (GOV); Wurfel, Sara (GOV); Lasher, Geralyn (DCH); Thelen, Mary Beth (DEQ)
Subject: Proposed Press Conference on Flint Drinking Water

Per the ongoing issues in Flint concerning their drinking water, I would offer the following recommendations. Let's discuss.

Recommendation

Press Conference in Flint – Wednesday, Thursday or Friday.

Participants

Mayor of Flint

Dan Wyant – Michigan Department of Environmental Quality

Nick Lyon – Department of Community Health

Susan Hedman – Region 5 Administrator or EPA

Harvey Hollins – Governor's office

Local Public Health Department

Announcement

Federal – State – Local action plan to address Flint Drinking Water

<!--[if !supportLists]-->1. <!--[endif]-->Governor Snyder names Dr. Eden Wells (DHHS Chief Medical Executive) as Flint drinking water Public Health Advisor.

<!--[if !supportLists]-->2. <!--[endif]-->All Flint schools water will immediately be tested to ensure that drinking water is safe.

<!--[if !supportLists]-->3. <!--[endif]-->Advisories will be disseminated recommending citizens flush your cold water pipes, use only water from the cold water tap for drinking, cooking and especially for making baby formula.

<!--[if !supportLists]-->4. <!--[endif]-->Implementation of fully optimized corrosion controls in the Flint drinking water system.

<!--[if !supportLists]-->5. <!--[endif]-->Expanded water testing of at risk

properties.

<!--[if !supportLists]-->6. <!--[endif]-->Offer water testing at no cost to Flint residents to assure water is safe.

<!--[if !supportLists]-->7. <!--[endif]-->Convene a safe drinking water “Technical Review Advisory” to ensure best technology, practices and science is being utilized, including EPA’s expertise and assistance from their Office of Research and Development.

<!--[if !supportLists]-->8. <!--[endif]-->Offer bottled water and premixed formula if test results indicate high levels of lead.

Dan Wyant, Director
Department of Environmental Quality
517-284-6700 (New Number)

From: [Wells, Eden \(DCH\)](#)
To: [Peeler, Nancy \(DHHS\)](#)
Cc: [Miller, Corinne \(DHHS\)](#); [Miller, Mark \(DHHS\)](#); [LyonCallo, Sarah \(DHHS\)](#); [Dykema, Linda D. \(DHHS\)](#); [Priem, Wesley F. \(DHHS\)](#); [Travis, Rashmi \(DHHS\)](#); [Fink, Brenda \(DHHS\)](#); [Scott, Robert L. \(DHHS\)](#)
Subject: Re: Hurley -- follow up about the question on Hurley lab results
Date: Wednesday, September 30, 2015 7:52:34 PM

Very cool-- what a way to learn about a program! Thx!

Sent from my iPhone

On Sep 30, 2015, at 6:50 PM, Peeler, Nancy (DCH) <PeelerN@michigan.gov> wrote:

I can partially answer your question now, will get additional info from Bob and send more later.

The data flows in daily, year-round. We process several thousand test results every week. We monitor the results daily, and have an algorithm for our follow-up response, based on the blood lead level.

Because we are processing results every day, we do see some patterns if they begin to emerge, especially with the higher lead levels. We normally track and report data at health department level, county level/Detroit. We are still building our capacity and putting new procedures in place via our CDC Surveillance grant to crank out more reports/report cards, and more frequent data reports, especially with the switch in focus to levels of 5 and above (which means we are focusing on a larger number of results than just 10 and above). We develop and share out many maps, charts, graphs, and yes, do publish an annual legislative report.

We have .2 FTE Epi support (Cristin Larder), mostly for special projects and/or reports, for example, Cristin is working with us and Dr. Stan Kaplowitz from MSU to use his research to help pinpoint smaller geographic areas with higher risk, so we can better direct resources toward those areas.

Bob, can you please add more information about frequency of your analysis, and how we detect issues?

From: Wells, Eden (DCH)
Sent: Wednesday, September 30, 2015 6:24 PM
To: Peeler, Nancy (DCH); Miller, Corinne (DCH); Miller, Mark (DCH); LyonCallo, Sarah (DCH); Dykema, Linda D. (DCH); Priem, Wesley F. (DCH); Travis, Rashmi (DCH)
Subject: RE: Hurley -- follow up about the question on Hurley lab results

That sounds about right.

May I ask,, is it CLPP's usual process to collect the lead data on an ongoing basis...if so, at what level is the data usually analyzed (by Epi?) IS it daily,nmonthly? Quarterly? Annually? How would we normally detect/know if there is an issue in a particular locality---do you look at it at county level or smaller when you peruse your data? This question may arise...

E

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 30, 2015 5:22 PM
To: Miller, Corinne (DCH); Miller, Mark (DCH); LyonCallo, Sarah (DCH); Dykema, Linda D. (DCH); Priem, Wesley F. (DCH); Travis, Rashmi (DCH); Wells, Eden (DCH)
Subject: FW: Hurley -- follow up about the question on Hurley lab results

Hi all – I talked to Bob to confirm the information I had shared about the Hurley lab results. It is a little more nuanced than I had explained, forwarding Bob's explanation, FYI.

From: Scott, Robert L. (DCH)
Sent: Wednesday, September 30, 2015 5:05 PM
To: Peeler, Nancy (DCH)
Subject: Hurley

Hurley Medical Center is listed as the "Provider" on approximately half of the blood lead results we received for Flint children in 2014—I assume that pattern holds in 2015 and in recent years. Warde Medical Lab is listed as the "Laboratory" on those results. Warde reported the results to CLPPP in accordance with State law.

I can't say whether the blood specimens were a) drawn at Hurley's lab, or b) simply passed through Hurley's lab—from physician office to Hurley to Warde for analysis. As I understand it, both scenarios are common at various hospital labs.

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: [Scott, Robert L. \(DHHS\)](#)
To: [Priem, Wesley F. \(DHHS\)](#)
Subject: RE: Flint water study
Date: Friday, September 11, 2015 2:53:06 PM

Prof. Marc Edwards, Virginia Tech

From: Priem, Wesley F. (DCH)
Sent: Friday, September 11, 2015 2:34 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Flint water study

I know when I share this with my Division Director Linda Dykema she will also want to know who sent the request in to you. She has been involved in this issue.

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 2:08 PM
To: Priem, Wesley F. (DCH); Peeler, Nancy (DCH); Lishinski, Karen (DCH)
Subject: RE: Flint water study

Yes, it looks that way, but that's how I received it.

From: Priem, Wesley F. (DCH)
Sent: Friday, September 11, 2015 1:57 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>; Peeler, Nancy (DCH) <PeelerN@michigan.gov>; Lishinski, Karen (DCH) <LishinskiK@michigan.gov>
Subject: RE: Flint water study

Bob:

Was this all that was sent to you, looks like the cover page is missing?

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:09 PM
To: Peeler, Nancy (DCH); Lishinski, Karen (DCH); Priem, Wesley F. (DCH)
Subject: Flint water study

Nancy, Karen and Wes,

I'm passing this along as follow-up to our previous attention to the Flint water changeover situation. The attached was submitted to me along with a request for de-identified data, which should be no problem.

When you have a few minutes you might want to take a look at it. Sounds like there might be more to this than what we learned previously. Yikes!

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: [Miller, Corinne \(DCH\)](#)
To: [Robinson, Mikelle \(DCH\)](#)
Cc: [Dykema, Linda D. \(DCH\)](#); [Moran, Susan \(DCH\)](#)
Subject: Re: Flint Water FAQ Document
Date: Wednesday, September 23, 2015 7:06:15 PM

Thanks for the update.

Sent from my iPhone

On Sep 23, 2015, at 5:04 PM, Robinson, Mikelle (DCH) <RobinsonM18@michigan.gov> wrote:

Hi Corinne and Linda,

Geralyn and Elizabeth requested a call with DEQ today in order to brief Nick and respond to some legislative inquiries. Below are my notes from the call that I sent to brief Sue and Mark as well as a Q & A document that DEQ developed and is currently being vetted by the Gov's office. Just wanted to be sure to keep you in the loop on this.

The DEQ PIO (Brad Wurfel) gave a long summary about the Flint water issue. He said bottom line is that the water itself is safe but they have an old water treatment plant and old cast iron pipes that haven't been upgraded in more than 40 years. 15,000 homes have old connections with varying levels of lead. Flint is not in violation of the lead standards however they could optimize the water supply by adding phosphate. Flint is also working on a meaningful optimization plan that will be completed sometime next year. He said that DEQ briefed the Mayor and some legislators on Monday on the situation. **He said Flint's water supply is not an imminent public health problem but a public confidence problem due to the many groups getting involved and controversial reports/media coverage on it.**

Some data from a local group of Peds is showing an uptick in blood lead levels which seems to contradict the data that CLPP collects. I've asked Rashmi to follow-up with Nancy P on a) the issue of the lead testing that a group of pediatricians did in Flint? b) messaging about lead, where it is found in the environment c) a brief explanation in writing that explains the results from the blood lead tests that Nancy's program has access to. I found the charts a bit hard to read/interpret. d) availability of any local programs that might be relevant, and e) anything else that might be useful for us to share with Genesee CHD. I'll also check with Linda D. on this. (*Linda, any thoughts on what might be useful?*)

DEQ developed a Q & A document that is being reviewed by the Gov's office and they will share with us. They will post this on their website after it is approved. DEQ would like the local health department to get involved in the messaging about what can be done such as running the water before using or get a filtration system. **Mark or I will need to follow-up with H.O. Valacak once we have some suggested talking points and information that can be provided to the public.**

The city owns only the first couple of feet of pipes in connections with homes, the rest is privately owned by the homeowner therefore it would be their expense to replace.

The longer water sits in lead pipes, the higher the lead readings. DEQ's testing protocol produces consistent results across the state and matches the EPA's protocol. There are other areas of the state with the same problem. He estimated it would take \$60 M to replace the city's infrastructure. The city has request \$30 M from the state to help with the situation. The state told them to check with Congress. But we are calling on EPA to assist along with our Congressional delegation.

Brad said they are hoping to have their director submit an op ed to the Flint paper (and perhaps have Nick co-sign) with a message such as lead is a serious issue and there are actions that can be taken to minimize exposure. He wants to coordinate our messaging to align. He will circle back with Geralyn on this. Also, they will be reviewing the various water test results and will look at Flint's water treatment protocols. He cautioned that they are receiving FOIA requests every day.

Let me know if you have questions.

Mikelle

From: [Miller, Corinne \(DCH\)](#)
To: [LyonCallo, Sarah \(DCH\)](#); [Dykema, Linda D. \(DCH\)](#)
Subject: RE: Flint Testing and EBLLs.xlsx
Date: Wednesday, July 29, 2015 8:54:24 AM

Thanks Sarah.

From: LyonCallo, Sarah (DCH)
Sent: Tuesday, July 28, 2015 5:01 PM
To: Miller, Corinne (DCH); Dykema, Linda D. (DCH)
Subject: FW: Flint Testing and EBLLs.xlsx

Attached is Cristin's work with the monthly EBLL proportion data for Flint.

From: Larder, Cristin (DCH)
Sent: Tuesday, July 28, 2015 4:54 PM
To: Scott, Robert L. (DCH); Peeler, Nancy (DCH)
Cc: LyonCallo, Sarah (DCH); McKane, Patricia (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx

Hello Nancy and Bob,

It turns out that adding in the additional two years of data did not change the results of the analysis: there does appear to be a higher proportion of EBLL last summer than usual. I wrote up my methods and results in the attached brief, just in case anyone asks for specifics.

Have a good night!

Cristin

From: Scott, Robert L. (DCH)
Sent: Tuesday, July 28, 2015 10:15 AM
To: Larder, Cristin (DCH); Peeler, Nancy (DCH); McKane, Patricia (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx

Cristin,

I can safely say I don't understand it without some explanation.

However, late yesterday Nancy and I decided to take a look two years farther back to see how they fit with the recent years. Please see attached, which I just finished this morning. Sorry I didn't have this for you yesterday before you did the analysis. Would this new information change the analysis?

Thanks,

Bob

From: Larder, Cristin (DCH)
Sent: Tuesday, July 28, 2015 10:07 AM
To: Peeler, Nancy (DCH); McKane, Patricia (DCH)
Cc: Scott, Robert L. (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx

Nancy and Bob,

Is the control chart clear enough, do you think? I could whip up a fact sheet with a description of what it shows, if you think it would help make it more digestible for our audience.

Cristin

From: Larder, Cristin (DCH)
Sent: Tuesday, July 28, 2015 9:25 AM
To: Peeler, Nancy (DCH); McKane, Patricia (DCH)
Cc: Scott, Robert L. (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx

Hi Nancy,

I made a p-chart, which Shewhart's version of a control chart for proportions, for the data you sent. Basically, I used the monthly data from 2013-14 to create upper and lower control limits, then plotted the 2014-15 data in a run chart. It shows that the three months in question are the only ones that lie outside the control limit: in fact, they are the only points that lie well above the mean at all. This doesn't say anything about causality, but it does warrant further investigation.

There are several next steps we can employ if the folks upstairs ask us to look deeper into the data. Also, I'm not sure if you talked at all with the Environmental Health folks, but their toxicologists could probably help give us some context to the issue.

Cristin

From: Peeler, Nancy (DCH)
Sent: Monday, July 27, 2015 3:37 PM
To: McKane, Patricia (DCH)
Cc: Larder, Cristin (DCH); Scott, Robert L. (DCH)
Subject: Re: Flint Testing and EBLLs.xlsx

Thanks, Patti. I'm looking forward to hearing about your CoIN meeting, I'm sure you will be bringing great information back.

Sent from my iPhone

On Jul 27, 2015, at 3:11 PM, "McKane, Patricia (DCH)"

<McKaneP@michigan.gov> wrote:

Thanks Nancy.

I was in a session on Shewart charts for QI. I think this might be a good approach for the needs assessment We can talk more. Hopefully the slides will be available, because I can't type that much with my thumbs

Sent from my iPhone

On Jul 27, 2015, at 1:14 PM, Peeler, Nancy (DCH)

<PeelerN@michigan.gov> wrote:

Hi Cristin and Patti –

This is the CLPPP data for Flint that I had mentioned to you last week. Cristin, can you quickly run any tests to see if the difference in the first graph is statistically significant? Bob is at his desk today, best to connect with him if you have questions about the data. We are hoping to send this up today, so we appreciate anything you can do to get us a response this afternoon, if at all possible. Many thanks!

Nancy

From: LyonCallo, Sarah (DCH)
To: Minicuci, Angela (DCH)
Cc: Larder, Cristin (DCH); Eisner, Jennifer (DCH); McKane, Patricia (DCH); Dykema, Linda D. (DCH)
Subject: Re: Flint follow-up
Date: Monday, September 28, 2015 12:24:08 PM

Cristin got a raw data set from Bob Scott about an hour ago. She is deduplicating records and classifying the exposure. Cristin is working as quickly as possible and has been pulled off any other work. However, it is highly unlikely that we can have an answer today. There is a lot of data analysis that needs to be done.

Sent from my iPad

On Sep 28, 2015, at 12:03 PM, Minicuci, Angela (DCH) <MinicuciA@michigan.gov> wrote:

Just circling back on this. Any updates?

Angela

From: LyonCallo, Sarah (DCH)
Sent: Monday, September 28, 2015 10:06 AM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Cc: Larder, Cristin (DCH) <LarderC@michigan.gov>; Eisner, Jennifer (DCH) <EisnerJ@michigan.gov>; McKane, Patricia (DCH) <McKaneP@michigan.gov>
Subject: Re: Flint follow-up
she is not in until 10 and then we need to get a data pull. i am in a meeting with sue, corinne and linda right now. i will be in touch asap

Sent from my iPad

On Sep 28, 2015, at 9:52 AM, Minicuci, Angela (DCH) <MinicuciA@michigan.gov> wrote:

Thanks Sarah. Do you know when Cristin will be in this morning?

Angela

From: LyonCallo, Sarah (DCH)
Sent: Monday, September 28, 2015 9:21 AM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Cc: Larder, Cristin (DCH) <LarderC@michigan.gov>; Eisner, Jennifer (DCH) <EisnerJ@michigan.gov>; McKane, Patricia (DCH) <McKaneP@michigan.gov>
Subject: Re: Flint follow-up

Hi Angela

Cristin had a medical appointment this morning. She and I are meeting this AM as soon as she gets in and are coordinating with Nancy Peeler who I understand ran the original counts.

Sarah

Sent from my iPad

On Sep 28, 2015, at 9:12 AM, Minicuci, Angela (DCH) <MinicuciA@michigan.gov> wrote:

Good morning Cristin,

Have you had a chance to look over the lead data yet? The Free Press issued a story over the weekend that we need to discuss with them today:

<http://www.freep.com/story/opinion/columnists/nancy-kaffer/2015/09/26/state-data-flint-lead/72920798/>

Can you call myself or Jen Eisner when you have a moment?

Thanks!

Angela

From: Larder, Cristin (DCH)
Sent: Friday, September 25, 2015 5:42 PM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Cc: LyonCallo, Sarah (DCH) <Lyoncallos@michigan.gov>; McKane, Patricia (DCH) <McKaneP@michigan.gov>
Subject: RE: Flint follow-up
Understood - Thanks, Angela.

From: Minicuci, Angela (DCH)

Sent: Friday, September 25, 2015 5:38 PM

To: Larder, Cristin (DCH)
Cc: LyonCallo, Sarah (DCH); McKane, Patricia (DCH)
Subject: RE: Flint follow-up
This as well, though this is not for public use.
Angela
From: Minicuci, Angela (DCH)
Sent: Friday, September 25, 2015 5:37 PM
To: Larder, Cristin (DCH) <LarderC@michigan.gov>
Cc: LyonCallo, Sarah (DCH) <Lyoncallos@michigan.gov>; McKane, Patricia (DCH) <McKaneP@michigan.gov>
Subject: RE: Flint follow-up
Not a problem. Let's connect on Monday. Also, attached is the data I have. Thanks!
Angela

From: Larder, Cristin (DCH)
Sent: Friday, September 25, 2015 5:33 PM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Cc: LyonCallo, Sarah (DCH) <Lyoncallos@michigan.gov>; McKane, Patricia (DCH) <McKaneP@michigan.gov>
Subject: RE: Flint follow-up
Hi Angela,
After looking at the data Kristi send you and talking with Sarah, I realize I do not have access to the data I need to answer her specific question about significance. I won't be able to get access before Monday.
Sorry I wasn't able to be helpful right now,
Cristin

From: Minicuci, Angela (DCH)
Sent: Friday, September 25, 2015 2:26 PM
To: Larder, Cristin (DCH)
Subject: FW: Flint follow-up
Hi Cristin,
Can you call me when you have a moment? 517-373-0860. Thanks!
Angela

From: Tanner, Kristi [<mailto:k.tanner@freepress.com>]
Sent: Friday, September 25, 2015 2:19 PM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Subject: RE: Flint follow-up
Angela,
Is it possible to speak to an epidemiologist before the end of day today?
Thanks!
Kristi
(313) 222-8877

From: Tanner, Kristi
Sent: Friday, September 25, 2015 12:16 PM
To: 'Minicuci, Angela (DCH)'
Subject: Flint follow-up
Hi Angela,
Thanks for the feedback yesterday. I took a look at the numbers last night that you sent over and the year over year increase between 13/14 and 14/15 is statistically significant p<.05

Can you ask you epidemiologist to confirm? Also, is this the first significant increase that Flint has seen for this cohort?

Thanks!

Kristi

(313) 222-8877 office

PPI

cell
Children in Flint, less than 16 years of age, tested for lead

Children with Elevated BLL*			Children Tested**	
May 2010 - April 2011	168	0.043796	May 2010 - April 2011	3,836
2011-2012	153	0.036085	2011-2012	4,240
2012-2013	118	0.028379	2012-2013	4,158
2013-2014	95	0.023691	2013-2014	4,010

2014-2015 May - August 2015	123	0.032106	2014-2015 May - August 2015	3,831
	34	0.029746		1,143

**Some children counted in more than one year.

*Each child counted only once.

September 24, 2015

Source: MDHHS Data Warehouse

From: [Marc Edwards](#)
To: [Dykema, Linda D. \(DCH\)](#)
Subject: RE: Flint Drinking Water Study
Date: Monday, September 28, 2015 12:52:56 PM
Attachments: [image002.gif](#)

Hi Linda, The sampling protocol is posted on the website. We also posted a video that instructs people on how to sample on the website.
Will send you some of the recent data ASAP...we have not posted it yet. Ask if you have any questions!

Best Regards,
Marc

From: Dykema, Linda D. (DCH) [mailto:DykemaL@michigan.gov]

Sent: Monday, September 28, 2015 12:45 PM

To: edwardsm@vt.edu

Subject: Flint Drinking Water Study

Importance: High

Dr. Edwards,

I am the Director of the Division of Environmental Health with the Michigan Department of Health & Human Services. I'm writing to request information regarding your study protocol and findings for testing for lead in drinking water in the city of Flint. I've been trying to obtain this information from the study web site, but unfortunately the it's not available, perhaps due to the high volume of traffic on the site.

If you can provide this information at your earliest convenience, I'd be very appreciative. As you can imagine, there is intense interest here in your study results. Thanks

Linda D. Dykema, Ph.D.

Environmental Public Health Director

Division of Environmental Health

Michigan Department of Health & Human Services

517.335.8566

dykemal@michigan.gov

From: [Miller, Corinne \(DCH\)](#)
To: [LyonCallo, Sarah \(DCH\)](#); [Dykema, Linda D. \(DCH\)](#)
Subject: RE: Director's Office Assignment -- Flint - need update asap
Date: Tuesday, July 28, 2015 12:23:13 PM

Thanks Sarah. Be sure to cc Brenda Fink too.

-----Original Message-----

From: LyonCallo, Sarah (DCH)
Sent: Tuesday, July 28, 2015 11:17 AM
To: Miller, Corinne (DCH); Dykema, Linda D. (DCH)
Subject: RE: Director's Office Assignment -- Flint - need update asap

Linda and I talked and I am going to cc you both when the request goes back to Nancy.
In the interim, Nancy wanted to add some more years of data to the comparison (so there are 4 total years of data).
Cristin is adding these years to the control chart for the proportion of first time elevated BLL of those tested using
method by Shewart for proportions. (Linda - the data are deduped to "kid".)

-----Original Message-----

From: Miller, Corinne (DCH)
Sent: Tuesday, July 28, 2015 11:11 AM
To: LyonCallo, Sarah (DCH)
Subject: FW: Director's Office Assignment -- Flint - need update asap

Below is the e-mail Linda sent to a group of individuals last week when the issue about lead in drinking water was raised. Linda reached out to the DEQ regional office that would work with Flint.

Both Brenda Fink and Nancy Peeler were included in Linda's response.

-----Original Message-----

From: Dykema, Linda D. (DCH)
Sent: Thursday, July 23, 2015 10:07 AM
To: Miller, Corinne (DCH); Peeler, Nancy (DCH); Anderson, Paula (DCH); Travis, Rashmi (DCH); Grijalva, Nancy (DCH); Moran, Susan (DCH)
Cc: Priem, Wesley F. (DCH); Bouters, Janese (DCH); Barr, Jacqui (DCH); Fink, Brenda (DCH); Groetsch, Kory J. (DCH)
Subject: RE: Director's Office Assignment -- Flint - need update asap

I spoke with Steve Busch, Lansing District Office manager, DEQ Office of Drinking Water & Municipal Assistance.

The city of Flint recently conducted drinking water testing throughout the city with special attention to those areas known to have old service lines. The city water supply is in compliance with the lead rule, which means that 90% of the water samples were less than the lead action level of 15 ppb. DEQ will, however, recommend that Flint further "optimize" their corrosion control methods. The DEQ has not seen a change in the city's compliance with the lead rule since switching to the Flint River source.

Some water samples had lead levels above 15 ppb. Homeowners receive their sampling results and those with elevated levels are provided with information regarding how to minimize their exposure, including replacement of water supply lines. The city pays for line replacement from the main to the property boundary. The property owner is responsible for some portion of the cost if the line replaced is on their property. To Steve's knowledge, there is no program in Flint to assist homeowners with limited financial means.

Regarding the home with high drinking water lead levels: some years ago the supply line that serves the neighborhood was replaced, but somehow this house was not connected to the new line, such that the family's

drinking water supply was coming from the old corroded lead pipe. None of the neighbors water had elevated lead levels, which was likely why she was temporarily connected by garden hose to a tap supplied by the new line. She has since been permanently connected to the new line.

Regarding the EPA drinking water official quoted in the press articles: the report that he issued was a result of his own research and was not reviewed or approved by EPA management. He has essentially acted outside his authority.

From: [Miller, Corinne \(DHHS\)](#)
To: [LyonCallo, Sarah \(DHHS\)](#); [Dykema, Linda D. \(DHHS\)](#); [Priem, Wesley F. \(DHHS\)](#)
Subject: Fwd: Talking Points
Date: Thursday, October 01, 2015 12:37:34 PM
Attachments: [Flint Water Talking Points.docx](#)
[ATT00001.htm](#)

Sent from my iPhone

Begin forwarded message:

From: "Eisner, Jennifer (DHHS)" <EisnerJ@michigan.gov>
Date: October 1, 2015 at 11:51:51 AM EDT
To: "Miller, Corinne (DHHS)" <MillerC39@michigan.gov>, "Robinson, Mikelle (DHHS)" <RobinsonM18@michigan.gov>
Cc: "Wells, Eden (DHHS)" <WellsE3@michigan.gov>
Subject: Talking Points

Corinne and Mikelle:

Attached please find the most recent Flint talking points which include edits from Dr. Wells. A 12:30 meeting with the gov's comms team was just called, so we need to have them finalized and ready to share asap.

Can you please send me the bullet points explaining the data – or what is ready of them – by noon?

Thank you,

Jennifer (Smith) Eisner
Public Information Officer
Michigan Department of Health and Human Services
517-241-2112

Blood Lead Levels in Flint Talking Points

October 1, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley;
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - there is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 49503 and 49504. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
- We reviewed MDHHS statewide data using the same methodology used by Hurley, looking at our numbers by zip code and age ranges, and filtering out non-Flint children.
- Routine surveillance of blood lead levels does not analyze data down to the zip code level. Detailed analysis like this occurs when there is reason to focus in on precise locations or populations.
- MDHHS will be working closely with the Michigan Department of Environmental Quality, Hurley Children's Hospital, the Genesee County Health Department, and community organizations to initiate further action steps.

- We understand that cost may be a barrier to following the recommendations of the local health department. We are actively working with public and private partners to make resources available to those who may need assistance.
- MDHHS is recommending that residents follow the Public Health Advisory issued by the Genesee County Health Department, as well as take further steps to reduce exposures to all forms of lead in and around their homes.

MDHHS Stats and Facts

- Data charts/breakdowns and explanations--
- Lead abatement through MDHHS was federally funded up until FY14 when Michigan began providing additional funds to abate homes.
- In FY14, \$1.25M General Fund was added. In FY15, General Fund was bumped up to \$1.75M and FY16, General Fund remains at \$1.75M.

Reducing and Removing Lead Exposure

- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
- Make sure your child does not have access to peeling paint or chewable surfaces painted with lead-based paint.
- Children and pregnant women should not be present in housing built before 1978 that is undergoing renovation. They should not participate in activities that disturb old paint or in cleaning up paint debris after work is completed.
- Create barriers between living/play areas and lead sources. Until environmental clean-up is completed, you should clean and isolate all sources of lead.
 - Close and lock doors to keep children away from chipping or peeling paint on walls. You can also apply temporary barriers such as contact paper or duct tape, to cover holes in walls or to block children's access to other sources of lead.
- Regularly wash children's hands and toys. Hands and toys can become contaminated from household dust or exterior soil. Both are known lead sources.
- Regularly wet-mop floors and wet-wipe window components. Because household dust is a major source of lead, you should wet-mop floors and wet-wipe horizontal surfaces every 2-3 weeks.
 - Windowsills and wells can contain high levels of leaded dust. They should be kept clean. If feasible, windows should be shut to prevent abrasion of painted surfaces or opened from the top sash.
- Take off shoes when entering the house to prevent bringing lead-contaminated soil in from outside.

- Prevent children from playing in bare soil; if possible, provide them with sandboxes. Plant grass on areas of bare soil or cover the soil with grass seed, mulch, or wood chips, if possible.
 - Until the bare soil is covered, move play areas away from bare soil and away from the sides of the house. If you have a sandbox, cover the box when not in use to prevent cats from using it as a litter box. That will help protect children from exposure to animal waste.
- Avoid using makeup, containers, cookware, or tableware to store or cook foods or liquids that are not shown to be lead free.
- Remove recalled toys and toy jewelry immediately from children.
- Use only cold water from the tap for drinking, cooking, and making baby formula. Hot water is more likely to contain higher levels of lead. Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.
- Shower and change clothes after finishing a task that involves working with lead-based products such as stained glass, making bullets, or using a firing range.

WIC Children

- There are 855 infants participating in WIC in Flint
- In homes with infants on WIC, if the household has documentation from an official source of unsanitary water supply issues, that family may be eligible to receive ready-to-feed formula. Families should contact WIC to see if they are eligible.
- Each household would have to be looked at on an individual basis.
- WIC cannot cover bottled water.

Background

- The results of the Hurley Children's Hospital were reviewed by MDHHS after the study was released last week.
- The analysis that Hurley conducted was different from the initial MDHHS data regarding blood lead levels in Flint.
- MDHHS initial data looked at the entire blood lead levels for the Flint area for the past five years and showed the annual seasonal trends in the area.
- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. Further, seasonal variations in water can occur due to changes in temperature, pH , and other factors

From: [Miller, Corinne \(DCH\)](#)
To: [Dykema, Linda D. \(DCH\)](#); [LyonCallo, Sarah \(DCH\)](#); [Priem, Wesley F. \(DCH\)](#)
Subject: Fwd: TIME SENSITIVE: Fw: Discrepancies
Date: Tuesday, September 29, 2015 2:45:44 PM
Attachments: [Flint Testing and EBLLs updated 092315 with notes \(2\).pdf](#)
[ATT00001.htm](#)
[Flint Testing and EBLLs \(4\).pdf](#)
[ATT00002.htm](#)
[STATELEADDATA with original and updated numbers.xlsx](#)
[ATT00003.htm](#)

FYI only. Keeping you in the loop regarding MDHHS CLPPP data.

Sent from my iPhone

Begin forwarded message:

From: "Wells, Eden (DCH)" <WellsE3@michigan.gov>
Date: September 29, 2015 at 2:41:54 PM EDT
To: "Peeler, Nancy (DCH)" <PeelerN@michigan.gov>
Cc: "Miller, Corinne (DCH)" <MillerC39@michigan.gov>, "Lasher, Geraldyn (DCH)" <lasherg@michigan.gov>, "Hertel, Elizabeth (DCH)" <HertelE@michigan.gov>
Subject: TIME SENSITIVE: Fw: Discrepancies

Hi Nancy,

I do not have Bob's email, so if you can talk to him; however, I got a request from Dr. Hanna-Attisha at Hurley today as to why the 2014-2015 may differ in the 2 pdf's she attached (received 9/15 and 9/25). FYI, she stated that Bob is great to work with.

However, due to different numbers and analyses and such flying around in the last 24 hours, please respond back to me ASAP regarding the discrepancies, and I can relay to her.

Thank you!

Eden

Eden V. Wells, MD, MPH, FACP
Chief Medical Executive
Michigan Department of Health and Human Services
201 Townsend Street, 5th Floor CVB

Lansing, MI 48913
Phone: 517-335-8011
wellse3@michigan.gov

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>

Sent: Tuesday, September 29, 2015 1:07 PM

To: Wells, Eden (DCH)

Subject: FW: Discrepancies

Dr Wells, in regards to the discrepancy noted in state data. Attached are two PDF files that were sent regarding the state lead numbers.

The original PDF was sent on 9/15/15 to Dr Reynolds from Bob Scott from MDHHS's Childhood Lead Poisoning Prevention Program and the updated PDF was sent to me from Bob Scott last Friday.

The attached excel database (that I created) has two tabs that include the original and updated numbers. Yellow highlights are all the numbers that changed. It is very strange how many of the numbers have changed. I'm not sure if the updated numbers tried to refine the location to Flint proper???

The analyses of the data does not change very much (when you look at total annual EBL%) - there has been a statistically significant increase in EBL% since water change (2014-2015) where every year prior there has been a decrease (as has happened nationally). And this does not even include the fact that the data is not scientific – wrong age range and missing lots of EBLS by using first time lead analysis rather than highest lead.

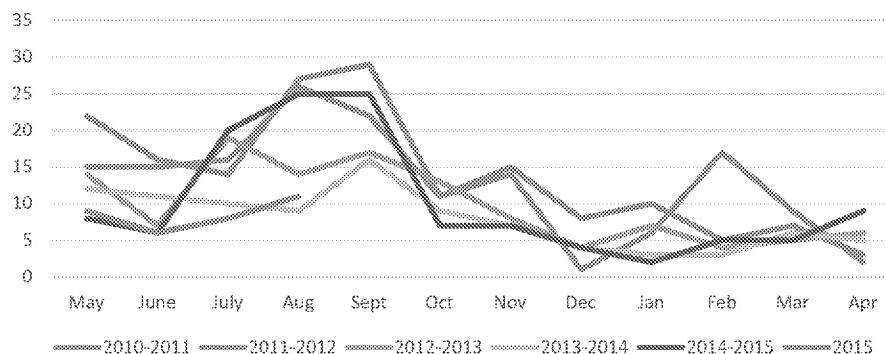
Just thought the discrepancy was odd.

Mona Hanna-Attisha MD MPH FAAP

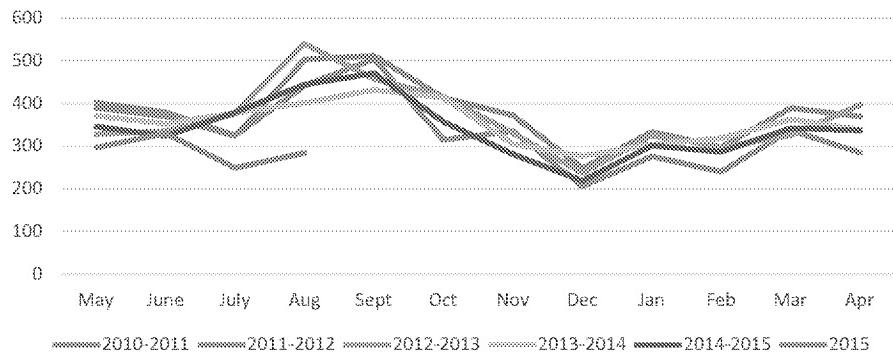
Program Director Pediatric Residency
Hurley Children's Hospital at Hurley Medical Center
Michigan State University College of Human Medicine
Department of Pediatrics and Human Development
Mhanna1@hurleymc.com



**City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels***



**City of Flint, Children less than 16 years of age
Tested for Lead Poisoning**



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	22	16	14	27	29	11	14	1	6	17	9	2
2011-2012	15	15	16	26	22	11	15	8	10	5	7	3
2012-2013	14	7	19	14	17	13	8	4	7	4	5	6
2013-2014	12	11	10	9	16	9	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	4	2	5	5	9
2015	9	6	8	11								

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	402	379	325	442	504	315	335	206	276	240	338	285
2011-2012	390	370	324	503	512	413	372	248	333	298	389	370
2012-2013	328	335	376	540	458	416	331	237	325	298	325	397
2013-2014	371	353	378	401	432	414	305	277	304	319	363	339
2014-2015	346	324	379	445	471	357	281	219	301	287	342	337
2015	297	330	249	284								

*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Less than 16 years of age at time of test

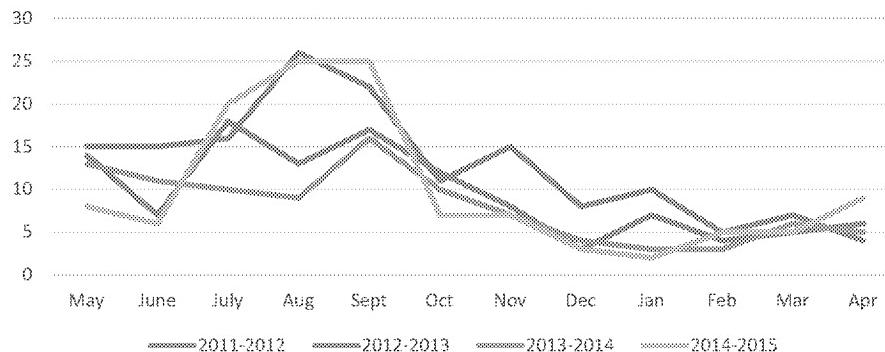
Includes only first-time blood lead levels $\geq 5 \text{ ug/dL}$

Includes sample type of venous, capillary or unknown

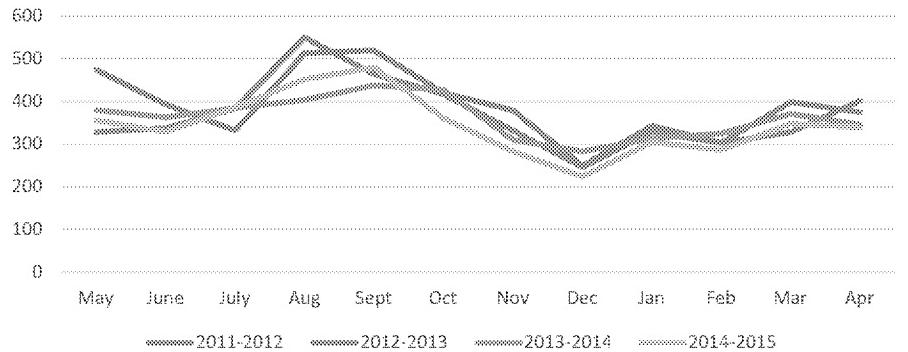
September 23, 2015

Source: MDHHS Data Warehouse, Lead Specimen table

**City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels**



**City of Flint, Children less than 16 years of age
Tested for Lead Poisoning**



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2011-2012	15	15	16	26	22	11	15	8	10	5	7	4
2012-2013	14	7	18	13	17	12	8	3	7	4	5	6
2013-2014	13	11	10	9	16	10	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	3	2	5	5	9

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2011-2012	474	393	332	513	520	420	379	249	343	303	399	375
2012-2013	328	338	383	550	464	417	332	246	328	303	328	402
2013-2014	380	363	385	404	438	427	310	283	313	325	371	346
2014-2015	356	329	386	452	480	361	283	224	305	287	348	339

	A	B	C	D	E	F	G	H	I	J	K
1											
2	NUMBER OF EBL										
3		May	June	July	August	September	October	November	December	January	February
4	2010-2011	NO DATA									
5	2011-2012	15	15	16	26	22	11	15	8	10	5
6	2012-2013	14	7	18	13	17	12	8	3	7	4
7	2013-2014	13	11	10	9	16	10	7	4	3	3
8	2014-2015	8	6	20	25	25	7	7	3	2	5
9											
10	TOTAL KIDS TESTED										
11		May	June	July	August	September	October	November	December	January	February
12	2010-2011	NO DATA									
13	2011-2012	474	393	332	513	520	420	379	249	343	303
14	2012-2013	328	338	383	550	464	417	332	246	328	303
15	2013-2014	380	363	385	404	438	427	310	283	313	325
16	2014-2015	356	329	386	452	480	361	283	224	305	287
17											
18											
19	EBL % BY MONTH										
20		May	June	July	August	September	October	November	December	January	February
21	2010-2011	NO DATA									
22	2011-2012	3.16%	3.82%	4.82%	5.07%	4.23%	2.62%	3.96%	3.21%	2.92%	1.65%
23	2012-2013	4.27%	2.07%	4.70%	2.36%	3.66%	2.88%	2.41%	1.22%	2.13%	1.32%
24	2013-2014	3.42%	3.03%	2.60%	2.23%	3.65%	2.34%	2.26%	1.41%	0.96%	0.92%

	L	M	N	
1				
2				
3	March	April	Total	
4				
5	7	4	154	
6	5	6	114	
7	6	5	97	
8	5	9	122	
9				
10				
11	March	April		
12				
13	399	375	4700	
14	328	402	4419	
15	371	346	4345	
16	348	339	4150	
17				
18				
19				
20	March	April	TOTAL EBL%	
21				
22	1.75%	1.07%	3.28%	
23	1.52%	1.49%	2.58%	
24	1.62%	1.45%	2.23%	

	A	B	C	D	E	F	G	H	I	J	K
25	2014-2015	2.25%	1.82%	5.18%	5.53%	5.21%	1.94%	2.47%	1.34%	0.66%	1.74%

	L	M	N
25	1.44%	2.65%	2.94%

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	NUMBER OF EBL											
3		May	June	July	August	September	October	November	December	January	February	March
4	2010-2011	22	16	14	27	29	11	14	1	6	17	9
5	2011-2012	15	15	16	26	22	11	15	8	10	5	7
6	2012-2013	14	7	19	14	17	13	8	4	7	4	5
7	2013-2014	12	11	10	9	16	9	7	4	3	3	6
8	2014-2015	8	6	20	25	25	7	7	4	2	5	5
9	2015	9	6	8	11							
10	TOTAL KIDS TESTED											
11		May	June	July	August	September	October	November	December	January	February	March
12	2010-2011	402	379	325	442	504	315	335	206	276	240	338
13	2011-2012	390	370	324	503	512	413	372	248	333	298	389
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15	2013-2014	371	353	378	401	432	414	305	277	304	319	363
16	2014-2015	346	324	379	445	471	357	281	219	301	287	342
17	2015	297	330	249	284							
18												
19	EBL % BY MONTH											
20		May	June	July	August	September	October	November	December	January	February	March
21	2010-2011	5.47%	4.22%	4.31%	6.11%	5.75%	3.49%	4.18%	0.49%	2.17%	7.08%	2.66%
22	2011-2012	3.85%	4.05%	4.94%	5.17%	4.30%	2.66%	4.03%	3.23%	3.00%	1.68%	1.80%
23	2012-2013	4.27%	2.09%	5.05%	2.59%	3.71%	3.13%	2.42%	1.69%	2.15%	1.34%	1.54%
24	2013-2014	3.23%	3.12%	2.65%	2.24%	3.70%	2.17%	2.30%	1.44%	0.99%	0.94%	1.65%
25	2014-2015	2.31%	1.85%	5.28%	5.62%	5.31%	1.96%	2.49%	1.83%	0.66%	1.74%	1.46%

	M	N
1		
2		
3	April	Total
4	2	168
5	3	153
6	6	118
7	5	95
8	9	123
9		
10		
11	April	
12	285	4047
13	370	4522
14	397	4366
15	339	4256
16	337	4089
17		
18		
19		
20	April	TOTAL EBL%
21	0.70%	4.15%
22	0.81%	3.38%
23	1.51%	2.70%
24	1.47%	2.23%
25	2.67%	3.01%

	A	B	C	D	E	F	G	H	I	J	K	L
26	2015	3.03%	1.82%	3.21%	3.87%							

	M	N
26		

From: [Miller, Corinne \(DHHS\)](#)
To: [LyonCallo, Sarah \(DHHS\)](#); [Dykema, Linda D. \(DHHS\)](#); [Priem, Wesley F. \(DHHS\)](#)
Subject: Fwd: Talking Points
Date: Thursday, October 01, 2015 12:37:34 PM
Attachments: [Flint Water Talking Points.docx](#)
[ATT00001.htm](#)

Sent from my iPhone

Begin forwarded message:

From: "Eisner, Jennifer (DHHS)" <EisnerJ@michigan.gov>
Date: October 1, 2015 at 11:51:51 AM EDT
To: "Miller, Corinne (DHHS)" <MillerC39@michigan.gov>, "Robinson, Mikelle (DHHS)" <RobinsonM18@michigan.gov>
Cc: "Wells, Eden (DHHS)" <WellsE3@michigan.gov>
Subject: Talking Points

Corinne and Mikelle:

Attached please find the most recent Flint talking points which include edits from Dr. Wells. A 12:30 meeting with the gov's comms team was just called, so we need to have them finalized and ready to share asap.

Can you please send me the bullet points explaining the data – or what is ready of them – by noon?

Thank you,

Jennifer (Smith) Eisner
Public Information Officer
Michigan Department of Health and Human Services
517-241-2112

Blood Lead Levels in Flint Talking Points

October 1, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley;
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - there is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 49503 and 49504. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
- We reviewed MDHHS statewide data using the same methodology used by Hurley, looking at our numbers by zip code and age ranges, and filtering out non-Flint children.
- Routine surveillance of blood lead levels does not analyze data down to the zip code level. Detailed analysis like this occurs when there is reason to focus in on precise locations or populations.
- MDHHS will be working closely with the Michigan Department of Environmental Quality, Hurley Children's Hospital, the Genesee County Health Department, and community organizations to initiate further action steps.

- We understand that cost may be a barrier to following the recommendations of the local health department. We are actively working with public and private partners to make resources available to those who may need assistance.
- MDHHS is recommending that residents follow the Public Health Advisory issued by the Genesee County Health Department, as well as take further steps to reduce exposures to all forms of lead in and around their homes.

MDHHS Stats and Facts

- Data charts/breakdowns and explanations--
- Lead abatement through MDHHS was federally funded up until FY14 when Michigan began providing additional funds to abate homes.
- In FY14, \$1.25M General Fund was added. In FY15, General Fund was bumped up to \$1.75M and FY16, General Fund remains at \$1.75M.

Reducing and Removing Lead Exposure

- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
- Make sure your child does not have access to peeling paint or chewable surfaces painted with lead-based paint.
- Children and pregnant women should not be present in housing built before 1978 that is undergoing renovation. They should not participate in activities that disturb old paint or in cleaning up paint debris after work is completed.
- Create barriers between living/play areas and lead sources. Until environmental clean-up is completed, you should clean and isolate all sources of lead.
 - Close and lock doors to keep children away from chipping or peeling paint on walls. You can also apply temporary barriers such as contact paper or duct tape, to cover holes in walls or to block children's access to other sources of lead.
- Regularly wash children's hands and toys. Hands and toys can become contaminated from household dust or exterior soil. Both are known lead sources.
- Regularly wet-mop floors and wet-wipe window components. Because household dust is a major source of lead, you should wet-mop floors and wet-wipe horizontal surfaces every 2-3 weeks.
 - Windowsills and wells can contain high levels of leaded dust. They should be kept clean. If feasible, windows should be shut to prevent abrasion of painted surfaces or opened from the top sash.
- Take off shoes when entering the house to prevent bringing lead-contaminated soil in from outside.

- Prevent children from playing in bare soil; if possible, provide them with sandboxes. Plant grass on areas of bare soil or cover the soil with grass seed, mulch, or wood chips, if possible.
 - Until the bare soil is covered, move play areas away from bare soil and away from the sides of the house. If you have a sandbox, cover the box when not in use to prevent cats from using it as a litter box. That will help protect children from exposure to animal waste.
- Avoid using makeup, containers, cookware, or tableware to store or cook foods or liquids that are not shown to be lead free.
- Remove recalled toys and toy jewelry immediately from children.
- Use only cold water from the tap for drinking, cooking, and making baby formula. Hot water is more likely to contain higher levels of lead. Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.
- Shower and change clothes after finishing a task that involves working with lead-based products such as stained glass, making bullets, or using a firing range.

WIC Children

- There are 855 infants participating in WIC in Flint
- In homes with infants on WIC, if the household has documentation from an official source of unsanitary water supply issues, that family may be eligible to receive ready-to-feed formula. Families should contact WIC to see if they are eligible.
- Each household would have to be looked at on an individual basis.
- WIC cannot cover bottled water.

Background

- The results of the Hurley Children's Hospital were reviewed by MDHHS after the study was released last week.
- The analysis that Hurley conducted was different from the initial MDHHS data regarding blood lead levels in Flint.
- MDHHS initial data looked at the entire blood lead levels for the Flint area for the past five years and showed the annual seasonal trends in the area.
- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. Further, seasonal variations in water can occur due to changes in temperature, pH , and other factors

From: [Wells, Eden \(DCH\)](#)
To: [Dykema, Linda D. \(DCH\)](#); [Miller, Corinne \(DCH\)](#)
Subject: Fwd: Prelim GIS results
Date: Tuesday, September 29, 2015 7:05:52 PM
Attachments: season water lead article.pdf
ATT00001.htm

FYI

Sent from my iPhone

Begin forwarded message:

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>
Date: September 29, 2015 at 6:49:47 PM EDT
To: "Wells, Eden (DCH)" <WellsE3@michigan.gov>
Subject: RE: Prelim GIS results

FYI in regards to seasonality, summer is also the peak for lead in water. Lots of literature regarding this, see attached article - most notably fig 3 which predicts the percentage of EBL in summer due to lead in water.

Mona Hanna-Attisha MD MPH

Director, Pediatric Residency Program

Hurley Children's Hospital at Hurley Medical Center

Assistant Professor, Department of Pediatrics and Human Development

Michigan State University College of Human Medicine

Office: 810-262-7257

mhanna1@hurleymc.com

From: Wells, Eden (DCH) [WellsE3@michigan.gov]
Sent: Tuesday, September 29, 2015 5:58 PM
To: Mona Hanna-Attisha
Subject: Re: Prelim GIS results

Good evening, Mona,

I am looking forward to our results as well.

I certainly understand your role and the need to address the problem you identified; as physicians, our ethical and professional vows to care for and prevent harm to our patients is paramount. No need for data wars- I think we are all just trying to be sure, as you and I said earlier, that we are comparing the same data the same way- "apples to apples".

Your point about water versus household sources is important, because that is certainly one of the issues here--how to identify what potential sources of lead are responsible for EBLs in children, particularly in the CLPP database. Household (paint) is the most common culprit---(this one contributes most to the seasonality), and need to get the best analysis of the data that can look at the association to potential water sources. More to follow!

I will follow-up in AM with our IRB folks and be sure they know that we have a wish to expedite--not sure how long the process is but will get an estimate.

Eden

Eden V. Wells, MD, MPH, FACPM

Chief Medical Executive

Michigan Department of Health and Human Services

201 Townsend Street, 5th Floor CVB

Lansing, MI 48913

Phone: 517-335-8011

wellse3@michigan.gov

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>
Sent: Tuesday, September 29, 2015 5:35 PM
To: Wells, Eden (DCH)
Subject: Re: Prelim GIS results

Thanks Eden.

Looking forward to seeing your analysis.

Our intent has never been to go public with anything. However, when we noticed our findings and the glaring correlation to elevated water lead levels in the same locations and learned that corrosion control was never added to the water treatment, we ethically could not stay silent. In addition, your annual EBL% supports our findings - annual decrease (as seen nationally) and then an increase post-water switch. We also knew that releasing our data would only incite a data war; however, the more we dig, the more alarming the results. (Do you know GM stopped using flint river water because it was too corrosive on their parts??? That should have alerted us to its effect on lead pipes.)

So as of now, no plans to release anything to public, although we did share some of the high risk location info to identify priority response areas (bottled water, filters, etc).

Lastly, the state lead screening programs underestimate risk from lead in water. Infants on formula are most at risk yet we screen when they are developmentally likely to be exposed from lead from house hold sources (paint, dust, soil, etc). Lead levels could have peaked at 4 months and dropped by 12 months.

Finally, we do hope we can receive our data request soon so we can do the exact same analysis.

Thanks and sorry for the long email. Mona

Mona Hanna-Attisha MD MPH FAAP
Director, Pediatric Residency Program
Hurley Children's Hospital

Michigan State University

On Sep 29, 2015, at 2:59 PM, Wells, Eden (DCH) <WellsE3@michigan.gov> wrote:

Hi Mona,

Quick question--

We hope to get prelim data analysis results starting this afternoon-confirmed likely in next day or so----not sure when you may be going public with the GIS but do you think will be before then? Or are you doing the overlay now? Hoping for coordination of "apples"--I have followed-up on your data request.

Eden

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>

Sent: Tuesday, September 29, 2015 12:25 PM

To: Wells, Eden (DCH)

Subject: Prelim GIS results

Dr Wells, thanks for the phone call. I appreciate your reaching out. Below is our most recent analysis looking more specifically at the City of Flint and focusing on wards/neighborhoods via GIS analysis. This is very preliminary, but even more frightening. Our next steps include overlaying this with the locations of lead service lines.

I would appreciate your efforts to expedite our data request for the raw data so that we can run similar analysis with your larger sample size.

Thanks again, and let me know if I can be of any assistance. Mona

Updated Findings:

Using GIS (Geographic Information System) map technology, we have further analyzed our blood lead level data. Our initial analysis examined children living in Flint zip codes, 48501-48507; however, this included households receiving non-Flint water. Our refined GIS-based analysis now includes only those households who receive water from the City of Flint.

The results reveal an even greater increase in the percentage of children with elevated blood lead levels (EBL). Pre-switch, the proportion of children with EBL was 2.4%, and post-switch the proportion was 4.9% ($p=0.019$). This is compared with our initial zip code-based analysis that showed pre-switch 2.1% and post-switch 4.0% ($p=0.025$). Once again, the change in non-Flint EBL% was not statistically significant.

Preliminary GIS analysis has identified certain areas within the city limits that experienced the greatest rate of EBL% increase. Specifically, we found the greatest increases in wards 5 and 6 (particularly in neighborhoods near Dupont St between University Ave and Pasadena Ave); the EBL% more than **tripled** in these wards. In ward 5, the EBL % increased from 4.9% to 15.7% ($p=0.038$). The area of intersection between wards 3, 4, and 5 (in the east side of the city) also appeared high. Lastly, ward 7 had high pre and post-levels EBL% above 5% (specifically in the western portion of the ward).

Of note, our results continue to correlate with the high water lead levels from the Virginia Tech samples. Most notably, the high percentage of EBL% in wards 5, 6, and 7 also correspond with the high water lead levels in wards 5, 6, and 7.

Mona Hanna-Attisha MD MPH FAAP
Program Director Pediatric Residency
Hurley Children's Hospital at Hurley Medical Center
Michigan State University College of Human Medicine
Department of Pediatrics and Human Development
Mhanna1@hurleymc.com

From: [LyonCallo, Sarah \(DCH\)](#)
To: [Dykema, Linda D. \(DCH\)](#)
Subject: Fwd: Flint Testing and EBLLs.xlsx
Date: Tuesday, July 28, 2015 10:22:48 AM
Attachments: [Flint Testing and EBLLs_CL.xlsx](#)
[ATT00001.htm](#)

Sent from my iPhone

Begin forwarded message:

From: "Larder, Cristin (DCH)" <LarderC@michigan.gov>
Date: July 27, 2015 at 10:00:10 PM EDT
To: "McKane, Patricia (DCH)" <McKaneP@michigan.gov>
Cc: "LyonCallo, Sarah (DCH)" <lyoncallos@michigan.gov>
Subject: RE: Flint Testing and EBLLs.xlsx

Thanks, Patti!

It took me a while to get it right, but I was able to create a p-chart, which is Shewhart's version of a control chart for proportions. I'm not sure if you can read the attachment, but I used the monthly data from 2013-14 to calculate a mean proportion, mean number of kids tested per month, plus upper and lower control limits. I then plotted the 2014-15 data on a p-chart with the mean, LCL, and UCL calculated from the previous year. The chart shows that the 3 months in question are the only ones above the UCL for the year.

Ideally, we would want to use more years of data to establish the control limits. Also, mapping the cases might help figure out if specific pipes were the source of exposure. Sarah also suggested a Poisson regression (factoring in such information as when the water treatment procedure changed to stop the chemical reaction), if the folks upstairs think we should investigate further. We could also test to see if reporting changed at all during the exposure period (e.g. were there more capillary tests or tests in general?).

If it looks okay to you, I'll send it off to Nancy as soon as I get in tomorrow. (She called over here this afternoon asking for it, so I'm sure she's anxious to send it upstairs.)

Good night,

Cristin

From: McKane, Patricia (DCH)
Sent: Monday, July 27, 2015 3:12 PM
To: Peeler, Nancy (DCH)
Cc: Larder, Cristin (DCH); Scott, Robert L. (DCH)
Subject: Re: Flint Testing and EBLLs.xlsx

Thanks Nancy.

I was in a session on Shewart charts for QI. I think this might be a good approach for the needs assessment We can talk more. Hopefully the slides will

be available, because I can't type that much with my thumbs

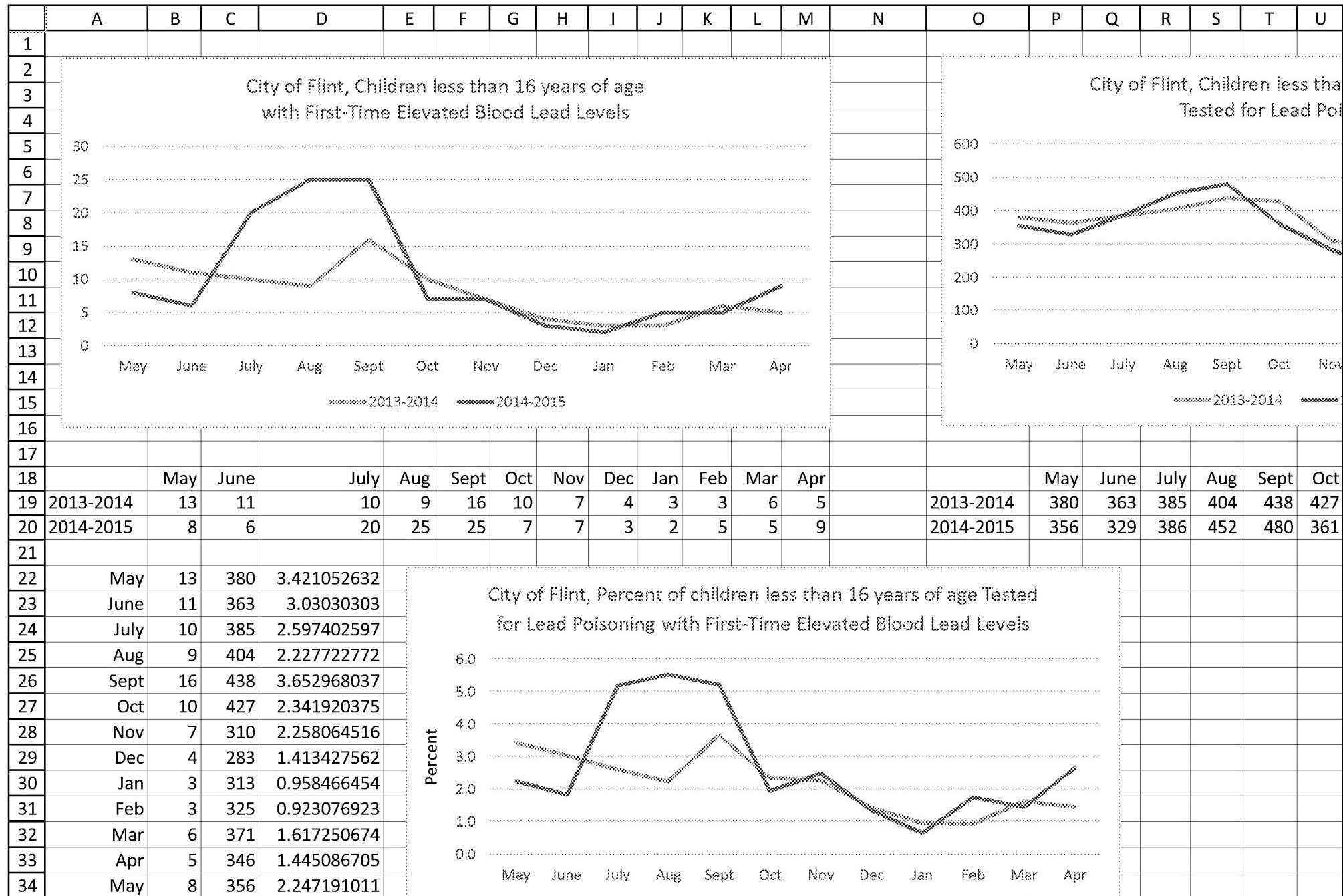
Sent from my iPhone

On Jul 27, 2015, at 1:14 PM, Peeler, Nancy (DCH) <PeelerN@michigan.gov> wrote:

Hi Cristin and Patti –

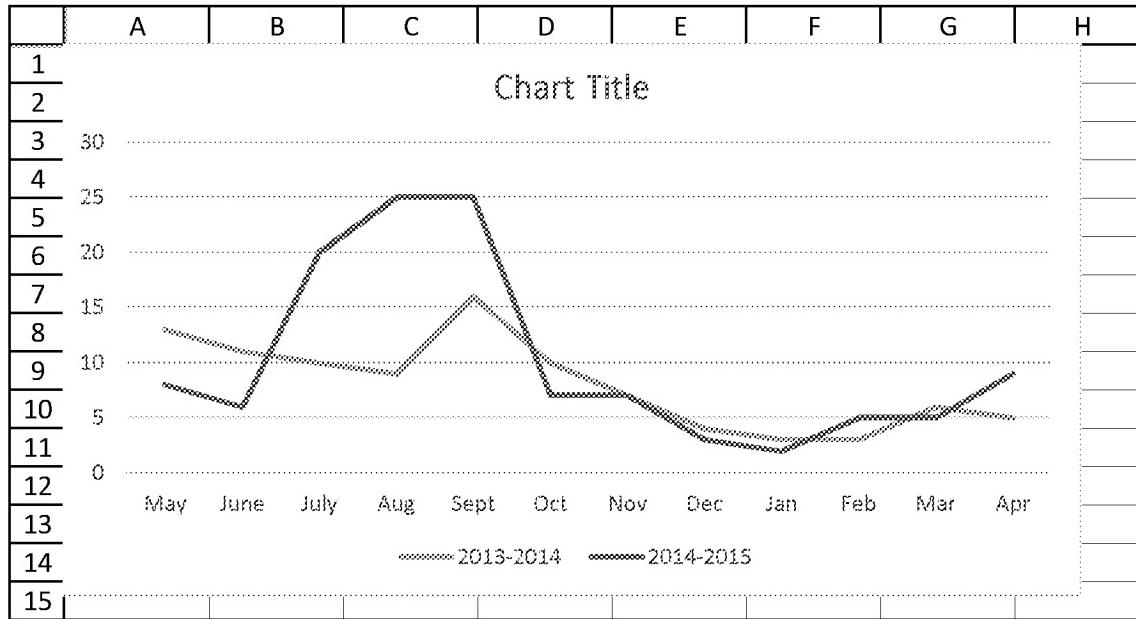
This is the CLPPP data for Flint that I had mentioned to you last week. Cristin, can you quickly run any tests to see if the difference in the first graph is statistically significant? Bob is at his desk today, best to connect with him if you have questions about the data. We are hoping to send this up today, so we appreciate anything you can do to get us a response this afternoon, if at all possible. Many thanks!

Nancy

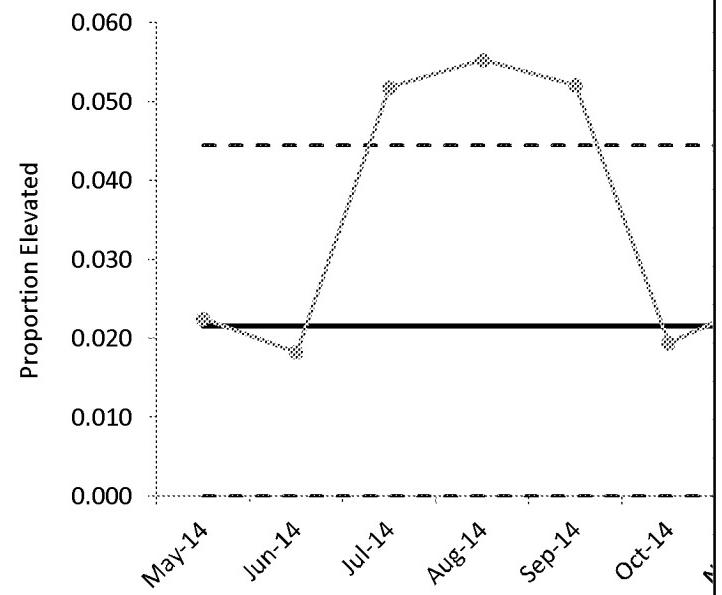


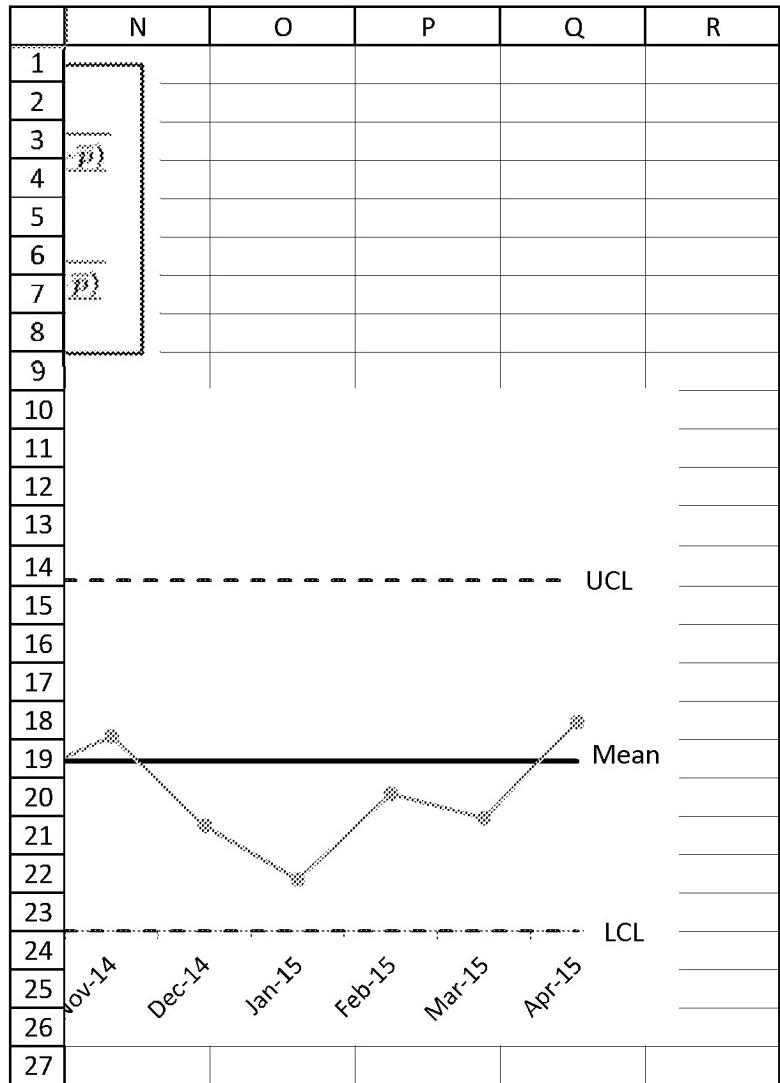
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3	soning						
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15	2014-2015						
16							
17							
18	Nov	Dec	Jan	Feb	Mar	Apr	
19	310	283	313	325	371	346	
20	283	224	305	287	348	339	
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	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Date	Elevated	Tested	Proportion	Mean P	P LCL	P UCL			2013/14			
2	May-13	13	380	0.034	0.022	0	0.04		Mean P	0.022			
3	Jun-13	11	363	0.030	0.022	0.00	0.04		Mean n	362.08			
4	Jul-13	10	385	0.026	0.022	0.00	0.04						
5	Aug-13	9	404	0.022	0.022	0.00	0.04						
6	Sep-13	16	438	0.037	0.022	0.00	0.04						
7	Oct-13	10	427	0.023	0.022	0.00	0.04						
8	Nov-13	7	310	0.023	0.022	0.00	0.04						
9	Dec-13	4	283	0.014	0.022	0.00	0.04						
10	Jan-14	3	313	0.010	0.022	0.00	0.04						
11	Feb-14	3	325	0.009	0.022	0.00	0.04						
12	Mar-14	6	371	0.016	0.022	0.00	0.04						
13	Apr-14	5	346	0.014	0.022	0.00	0.04						
14	May-14	8	356	0.022	0.022	0.00	0.04						
15	Jun-14	6	329	0.018	0.022	0.00	0.04						
16	Jul-14	20	386	0.052	0.022	0.00	0.04						
17	Aug-14	25	452	0.055	0.022	0.00	0.04						
18	Sep-14	25	480	0.052	0.022	0.00	0.04						
19	Oct-14	7	361	0.019	0.022	0.00	0.04						
20	Nov-14	7	283	0.025	0.022	0.00	0.04						
21	Dec-14	3	224	0.013	0.022	0.00	0.04						
22	Jan-15	2	305	0.007	0.022	0.00	0.04						
23	Feb-15	5	287	0.017	0.022	0.00	0.04						
24	Mar-15	5	348	0.014	0.022	0.00	0.04						
25	Apr-15	9	339	0.027	0.022	0.00	0.04						
26													
27													





From: [LyonCallo, Sarah \(DCH\)](#)
To: [Dykema, Linda D. \(DCH\)](#)
Subject: Fwd: Flint follow-up
Date: Monday, September 28, 2015 9:51:44 AM
Attachments: [BLLs in Flint.pdf](#)
[ATT00001.htm](#)

Sent from my iPad

Begin forwarded message:

From: "Minicuci, Angela (DCH)" <MinicuciA@michigan.gov>
Date: September 25, 2015 at 5:36:40 PM EDT
To: "Larder, Cristin (DCH)" <LarderC@michigan.gov>
Cc: "LyonCallo, Sarah (DCH)" <lyoncallos@michigan.gov>, "McKane, Patricia (DCH)" <McKaneP@michigan.gov>
Subject: RE: Flint follow-up

Not a problem. Let's connect on Monday. Also, attached is the data I have. Thanks!

Angela

From: Larder, Cristin (DCH)
Sent: Friday, September 25, 2015 5:33 PM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Cc: LyonCallo, Sarah (DCH) <lyoncallos@michigan.gov>; McKane, Patricia (DCH) <McKaneP@michigan.gov>
Subject: RE: Flint follow-up

Hi Angela,

After looking at the data Kristi send you and talking with Sarah, I realize I do not have access to the data I need to answer her specific question about significance. I won't be able to get access before Monday. Sorry I wasn't able to be helpful right now,

Cristin

From: Minicuci, Angela (DCH)
Sent: Friday, September 25, 2015 2:26 PM
To: Larder, Cristin (DCH)
Subject: FW: Flint follow-up
Hi Cristin,

Can you call me when you have a moment? 517-373-0860. Thanks!
Angela

From: Tanner, Kristi [<mailto:ktanner@freepress.com>]
Sent: Friday, September 25, 2015 2:19 PM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Subject: RE: Flint follow-up

Angela,

Is it possible to speak to an epidemiologist before the end of day today?
Thanks!

Kristi

(313) 222-8877

From: Tanner, Kristi
Sent: Friday, September 25, 2015 12:16 PM
To: 'Minicuci, Angela (DCH)'

Subject: Flint follow-up

Hi Angela,

Thanks for the feedback yesterday. I took a look at the numbers last night that you sent over and the year over year increase between 13/14 and 14/15 is statistically significant p<.05
Can you ask your epidemiologist to confirm? Also, is this the first significant increase that Flint has seen for this cohort?

Thanks!

Kristi

(313) 222-8877 office

PPI

cell

Children in Flint, less than 16 years of age, tested for lead

Children with Elevated BLL*			Children Tested**		
May 2010 - April 2011	168	0.043796	May 2010 - April 2011	3,836	
2011-2012	153	0.036085	2011-2012	4,240	
2012-2013	118	0.028379	2012-2013	4,158	
2013-2014	95	0.023691	2013-2014	4,010	
2014-2015	123	0.032106	2014-2015	3,831	
May - August 2015	34	0.029746	May - August 2015	1,143	

**Some children counted in more than one year.

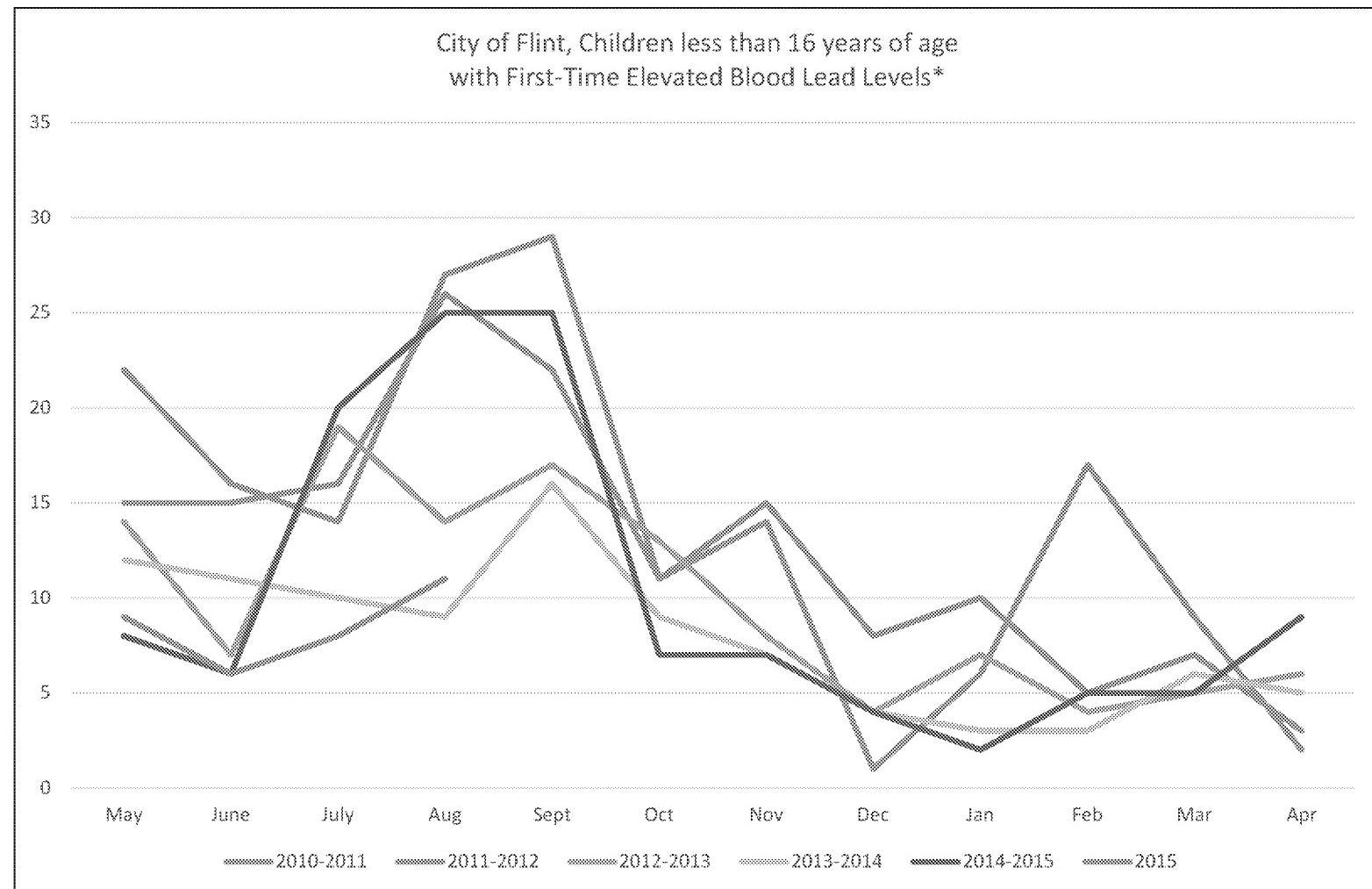
*Each child counted only once.

September 24, 2015

Source: MDHHS Data Warehouse

Blood Lead Testing of Children in Flint, Before and After the Change in Flint's Water

- The change in Flint's water source occurred in April 2014. MDHHS looked at children's blood lead levels (BLL) before and after this event.
- The dark blue line (May 2014 – April 2015) and the green line (May-August 2015) reflect children's blood lead tests after the change. All other lines reflect tests before the change.
- An increase in childhood lead poisoning in summer (July, August, September) is typical throughout Michigan every year.
- While there is a dramatic difference between the numbers of elevated BLL in the summer before and after the event, a wider look that includes data back to 2010 shows that the year BEFORE the event (the yellow line) was more of an anomaly than the year after (the dark blue line).
- If elevated BLL were being driven by the change in water, we would expect the dark blue line to stay high rather than follow the seasonal pattern.
- All data included in this analysis were reported by laboratories directly to MDHHS, in accordance with State law.



*This graph includes:

Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Children less than 16 years of age at time of test

Only first-time blood lead levels $\geq 5 \text{ ug/dL}$

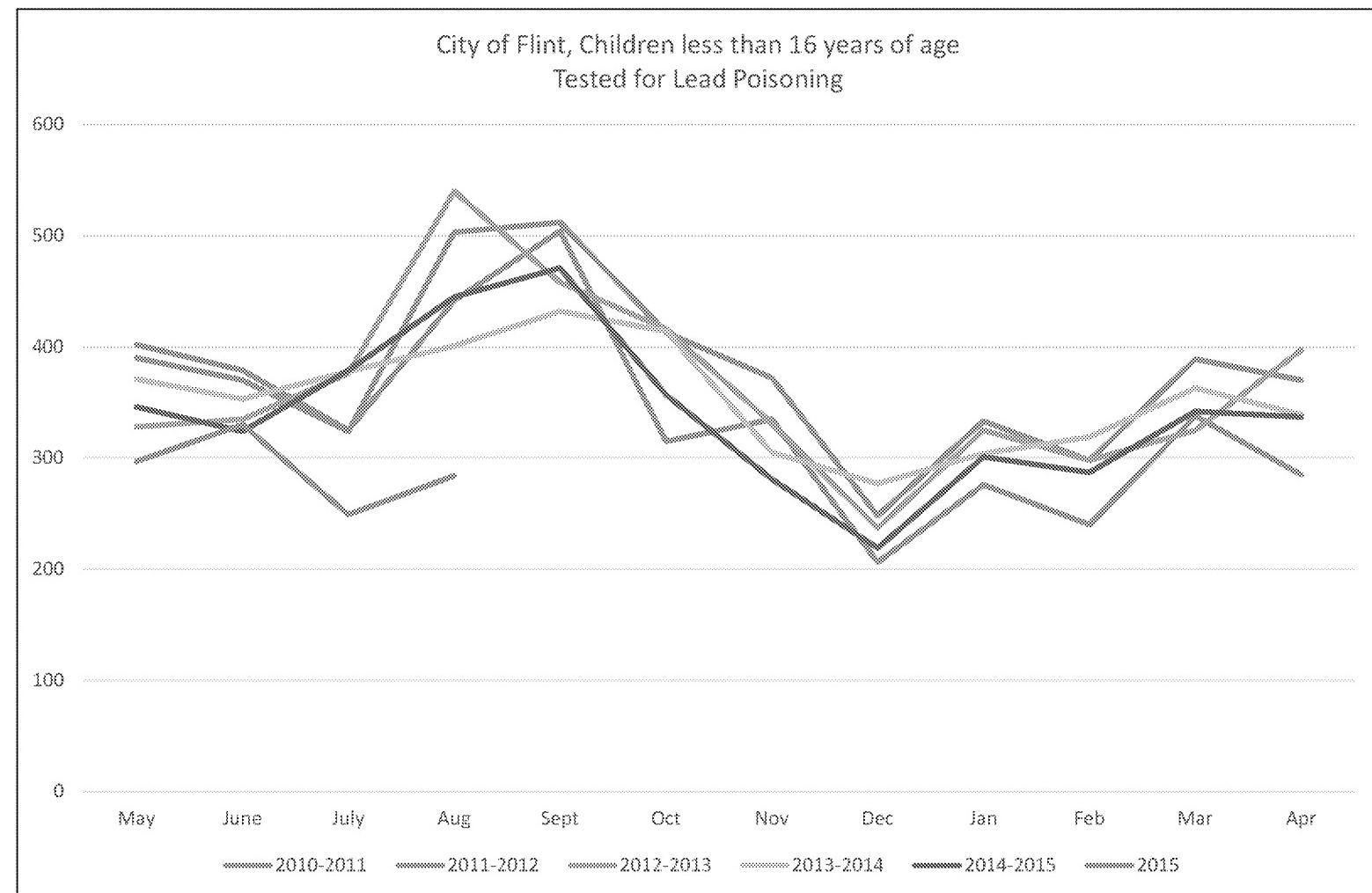
All first-time elevated levels, regardless of sample type (venous, capillary or unknown)

September 24, 2015

Source: MDHHS Data Warehouse,
Lead Specimen table

Blood Lead Testing of Children in Flint, Before and After the Change in Flint's Water

- Blood lead testing (regardless of elevated levels) also tends to rise during late summer (August, September, October).
- This graph shows that testing in Flint has remained fairly steady over the last five years, except for a recent decline (May – August 2015).



*This graph includes:

Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Children less than 16 years of age at time of test

The number of children tested within each month.

Some children are tested more than once, and may be included in more than one month or year.

September 24, 2015

Source: MDHHS Data Warehouse,
Lead Specimen table

From: Miller, Corinne (DHHS)
To: LyonCallo, Sarah (DHHS); Dykema, Linda D. (DHHS)
Subject: FW: Updated Talking points
Date: Tuesday, October 06, 2015 8:47:41 AM
Attachments: Flint Water Talking Points 100515.docx
ATT00001.htm

They didn't take the gasoline out per your suggestion Linda but altered the sentence on lead paint exposure from earlier versions at least.

From: Wells, Eden (DHHS)
Sent: Monday, October 05, 2015 5:49 PM
To: Travis, Rashmi (DHHS); Miller, Corinne (DHHS); LyonCallo, Sarah (DHHS); Peeler, Nancy (DHHS); Scott, Robert L. (DHHS); Moran, Susan (DHHS); Bien, Stan (DHHS)
Subject: Fwd: Updated Talking points

Forwarding-

Sent from my iPhone

Begin forwarded message:

From: "Lasher, Geralyn (DHHS)" <lasherg@michigan.gov>
Date: October 5, 2015 at 5:44:03 PM EDT
To: "Beurer, Terrence (DHHS)" <BeurerT@michigan.gov>, "Lyon, Nick (DHHS)" <LyonN2@michigan.gov>, "Grijalva, Nancy (DHHS)" <GrijalvaN@michigan.gov>, "Becker, Timothy (DHHS)" <beckert1@michigan.gov>, "Hertel, Elizabeth (DHHS)" <HertelE@michigan.gov>, "Thompson, Sheryl D. (DHHS)" <ThompsonS2@michigan.gov>, "Wells, Eden (DHHS)" <WellsE3@michigan.gov>, "Moran, Susan (DHHS)" <MoranS@michigan.gov>, "Ray, Patricia (DHHS)" <RayP2@michigan.gov>, "Ruest, Karla (DHHS)" <RuestK@michigan.gov>
Cc: "Eisner, Jennifer (DHHS)" <EisnerJ@michigan.gov>, "Minicuci, Angela (DHHS)" <MinicuciA@michigan.gov>, "Ridley, Nancy (DHHS)" <RidleyN@michigan.gov>, "Wheaton, Bob (DHHS)" <WheatonB@michigan.gov>
Subject: Updated Talking points

All—attached please find the updated talking points reflecting the new information today on water filter distribution.

Just wanted to make sure everyone had the most recent version.

Thanks--g

Blood Lead Levels in Flint Talking Points

October 5, 2015

- Initial analysis of MDHHS data found that blood lead levels (BLLs) of children in Flint have followed an expected seasonal trend; due to small numbers further analysis was initiated.
- While this analysis of blood lead levels in Flint as a whole remains true, after a comprehensive and detailed review down to the zip code level, we have found that the state analysis is consistent with that presented by Hurley.
- Director Lyon is working closely with DEQ and the administration to take active steps to reduce all potential lead exposures in Flint, and across the state.
- Our Chief Medical Executive has been in communication with the lead investigator at Hurley Children's Hospital, and we continue to work with Hurley, the city of Flint, local and state leaders to verify and analyze data trends.
- Zip code-level data does show that there has been an increase in elevated childhood blood lead levels in specific communities.
 - This does not conclusively mean that the water source change is the sole cause of the increase, but data does show an association.
 - There is an increased proportion of children with elevated Blood Levels (ELBs) in several zip codes, particularly 03 and 04. These appear to have increased over the last 1.5 years.
 - Lead exposure can occur from a number of different sources (such as paint, gasoline, solder, and consumer products) and through different pathways (such as air, food, water, dust, and soil).
 - Although there are several exposure sources, lead-based paint is still the most widespread and dangerous high-dose source of lead exposure for young children in the US and Michigan.
- We reviewed MDHHS statewide data using the same methodology used by Hurley, looking at our numbers by zip code and age ranges, and filtering out non-Flint children.
- Routine surveillance of blood lead levels does not analyze data down to the zip code level. Detailed analysis like this occurs when there is reason to focus in on precise locations or populations.
- MDHHS will be working closely with the Michigan Department of Environmental Quality, Hurley Children's Hospital, the Genesee County Health Department, and community organizations to initiate further action steps.
- We understand that cost may be a barrier to following the recommendations of the local health department. We are actively working with public and private partners to make resources available to those who may need assistance.

- MDHHS is recommending that residents follow the Public Health Advisory issued by the Genesee County Health Department, as well as take further steps to reduce exposures to all forms of lead in and around their homes.

MDHHS Stats and Facts

- ‘High Risk’ Zip codes (48503 and 48504)
 - Blood lead level rates among children under six years of age in the high risk zip codes (48503, 48504) were 2.7 times higher than the rest of Genesee County before the switch to Flint River Water.
 - After the switch to Flint River Water, rates in the high risk Zip codes were 3.2 times that of the rest of Genesee County.
- Other Zip codes in Flint
 - Rates of elevated blood lead levels among children under six years of age in other parts of the city of Flint were 2 times that of the rest of Genesee County before the switch to Flint River Water.
 - The magnitude of the elevated rate remained roughly the same during the period after the water source switch.
- Lead abatement through MDHHS was federally funded up until FY14 when Michigan began providing additional funds to abate homes.
- In FY14, \$1.25M General Fund was added. In FY15, General Fund was bumped up to \$1.75M and FY16, General Fund remains at \$1.75M.

Water Filters

- Our first action item is to work closely with our public and private partners to provide water filters to Flint residents and MDHHS clients.
- To meet this priority, the governor identified one million dollars in state funding to purchase water filters for Flint residents.
- Free water filters are available to current Michigan Department of Health and Human Services clients and Flint residents at four locations:
 - Flint residents who are not current MDHHS clients should visit one of two Genesee County Community Action Resource Department offices to obtain a filter.
 - at 2727 Lippincott and 601 North Saginaw in Flint
 - Current MDHHS clients in the city of Flint should visit their local MDHHS office
 - At 125 E. Union St. or 4809 Clio Road
- Staff will be onsite at all four locations from 9 a.m. to 4 p.m., Monday through Friday, to distribute filters and assist residents who have questions about proper installation.

- Given the questions and concerns regarding the change in water source in Flint, MDHHS authorized the use of emergency services funding to provide water filters for MDHHS clients receiving assistance in the city of Flint.
- This funding will support active Family Independence Program (FIP), Food Assistance Program (FAP), Child Development and Care (CDC), State Disability Assistance (SDA), State Disability Assistance (SDA), or Social Security Insurance (SSI) recipients so that they can obtain filters that are National Sanitation Foundation (NSF) certified to remove lead and ANSI Standard 53.
- MDHHS currently serves approximately 25,000 households in Flint.

Reducing and Removing Lead Exposure

- In housing built before 1978, it can be assumed that the paint has lead unless tests show otherwise.
- Make sure your child does not have access to peeling paint or chewable surfaces painted with lead-based paint.
- Children and pregnant women should not be present in housing built before 1978 that is undergoing renovation. They should not participate in activities that disturb old paint or in cleaning up paint debris after work is completed.
- Create barriers between living/play areas and lead sources. Until environmental clean-up is completed, you should clean and isolate all sources of lead.
 - Close and lock doors to keep children away from chipping or peeling paint on walls. You can also apply temporary barriers such as contact paper or duct tape, to cover holes in walls or to block children's access to other sources of lead.
- Regularly wash children's hands and toys. Hands and toys can become contaminated from household dust or exterior soil. Both are known lead sources.
- Regularly wet-mop floors and wet-wipe window components. Because household dust is a major source of lead, you should wet-mop floors and wet-wipe horizontal surfaces every 2-3 weeks.
 - Windowsills and wells can contain high levels of leaded dust. They should be kept clean. If feasible, windows should be shut to prevent abrasion of painted surfaces or opened from the top sash.
- Take off shoes when entering the house to prevent bringing lead-contaminated soil in from outside.
- Prevent children from playing in bare soil; if possible, provide them with sandboxes. Plant grass on areas of bare soil or cover the soil with grass seed, mulch, or wood chips, if possible.
 - Until the bare soil is covered, move play areas away from bare soil and away from the sides of the house. If you have a sandbox, cover the box when not in

use to prevent cats from using it as a litter box. That will help protect children from exposure to animal waste.

- Avoid using makeup, containers, cookware, or tableware to store or cook foods or liquids that are not shown to be lead free.
- Remove recalled toys and toy jewelry immediately from children.
- Use only cold water from the tap for drinking, cooking, and making baby formula. Hot water is more likely to contain higher levels of lead. Most of the lead in household water usually comes from the plumbing in your house, not from the local water supply.
- Shower and change clothes after finishing a task that involves working with lead-based products such as stained glass, making bullets, or using a firing range.

WIC Children

- There are 855 infants participating in WIC in Flint.
- We are working with partners at the United Way to ensure that WIC families have access to water filters and bottled water.
- In homes with infants on WIC, if the household has documentation from an official source of unsanitary water supply issues, that family may be eligible to receive ready-to-feed formula. Families should contact WIC to see if they are eligible.
- Each household would have to be looked at on an individual basis.
- WIC cannot cover bottled water.

Background

- The results of the Hurley Children's Hospital were reviewed by MDHHS after the study was released last week.
- The analysis that Hurley conducted was different from the initial MDHHS data regarding blood lead levels in Flint.
- MDHHS initial data looked at the entire blood lead levels for the Flint area for the past five years and showed the annual seasonal trends in the area.
- Seasonal exposure is higher in the summer for a variety of reasons including children playing outside in the soil, and when windows are open and lead paint is more likely to be in the air. Further, seasonal variations in water can occur due to changes in temperature, pH , and other factors

From: [Miller, Corinne \(DCH\)](#)
To: [Dykema, Linda D. \(DCH\)](#); [LyonCallo, Sarah \(DCH\)](#)
Subject: FW: Prelim GIS results
Date: Wednesday, September 30, 2015 8:45:36 AM

From: Wells, Eden (DCH)
Sent: Tuesday, September 29, 2015 6:31 PM
To: Lasher, Geralyn (DCH); Hertel, Elizabeth (DCH); Miller, Corinne (DCH); Moran, Susan (DCH)
Subject: Fw: Prelim GIS results
FYI only on latest exchange with Mona.

E

From: Wells, Eden (DCH)
Sent: Tuesday, September 29, 2015 5:58 PM
To: Mona Hanna-Attisha
Subject: Re: Prelim GIS results

Good evening, Mona,
I am looking forward to our results as well.

I certainly understand your role and the need to address the problem you identified; as physicians, our ethical and professional vows to care for and prevent harm to our patients is paramount. No need for data wars- I think we are all just trying to be sure, as you and I said earlier, that we are comparing the same data the same way- "apples to apples".

Your point about water versus household sources is important, because that is certainly one of the issues here--how to identify what potential sources of lead are responsible for EBLs in children, particularly in the CLPP database. Household (paint) is the most common culprit---(this one contributes most to the seasonality), and need to get the best analysis of the data that can look at the association to potential water sources. More to follow!

I will follow-up in AM with our IRB folks and be sure they know that we have a wish to expedite--not sure how long the process is but will get an estimate.

Eden

Eden V. Wells, MD, MPH, FACPM
Chief Medical Executive
Michigan Department of Health and Human Services
201 Townsend Street, 5th Floor CVB
Lansing, MI 48913
Phone: 517-335-8011
wellse3@michigan.gov

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>
Sent: Tuesday, September 29, 2015 5:35 PM
To: Wells, Eden (DCH)
Subject: Re: Prelim GIS results

Thanks Eden.

Looking forward to seeing your analysis.

Our intent has never been to go public with anything. However, when we noticed our findings

and the glaring correlation to elevated water lead levels in the same locations and learned that corrosion control was never added to the water treatment, we ethically could not stay silent. In addition, your annual EBL% supports our findings - annual decrease (as seen nationally) and then an increase post-water switch. We also knew that releasing our data would only incite a data war; however, the more we dig, the more alarming the results. (Do you know GM stopped using flint river water because it was too corrosive on their parts???) That should have alerted us to its effect on lead pipes.)

So as of now, no plans to release anything to public, although we did share some of the high risk location info to identify priority response areas (bottled water, filters, etc).

Lastly, the state lead screening programs underestimate risk from lead in water. Infants on formula are most at risk yet we screen when they are developmentally likely to be exposed from lead from household sources (paint, dust, soil, etc). Lead levels could have peaked at 4 months and dropped by 12 months.

Finally, we do hope we can receive our data request soon so we can do the exact same analysis.

Thanks and sorry for the long email. Mona
Mona Hanna-Attisha MD MPH FAAP
Director, Pediatric Residency Program
Hurley Children's Hospital
Michigan State University

On Sep 29, 2015, at 2:59 PM, Wells, Eden (DCH) <WellsE3@michigan.gov> wrote:

Hi Mona,

Quick question--

We hope to get prelim data analysis results starting this afternoon-confirmed likely in next day or so----not sure when you may be going public with the GIS but do you think will be before then? Or are you doing the overlay now? Hoping for coordination of "apples"--I have followed-up on your data request.

Eden

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>

Sent: Tuesday, September 29, 2015 12:25 PM

To: Wells, Eden (DCH)

Subject: Prelim GIS results

Dr Wells, thanks for the phone call. I appreciate your reaching out. Below is our most recent analysis looking more specifically at the City of Flint and focusing on wards/neighborhoods via GIS analysis. This is very preliminary, but even more frightening. Our next steps include overlaying this with the locations of lead service lines.

I would appreciate your efforts to expedite our data request for the raw data so that we can run similar analysis with your larger sample size. Thanks again, and let me know if I can be of any assistance. Mona

Updated Findings:

Using GIS (Geographic Information System) map technology, we have further analyzed our blood lead level data. Our initial analysis examined children living in Flint zip codes, 48501-48507; however, this included households receiving non-Flint water. Our refined GIS-based analysis now includes only those households who receive water from the City of Flint.

The results reveal an even greater increase in the percentage of children with elevated blood lead levels (EBL). Pre-switch, the proportion of children with EBL was 2.4%, and post-switch the proportion was 4.9% ($p=0.019$). This is compared with our initial zip code-based analysis that showed pre-switch 2.1% and post-switch 4.0% ($p=0.025$). Once again, the change in non-Flint EBL% was not statistically significant.

Preliminary GIS analysis has identified certain areas within the city limits that experienced the greatest rate of EBL% increase. Specifically, we found the greatest increases in wards 5 and 6 (particularly in neighborhoods near Dupont St between University Ave and Pasadena Ave); the EBL% more than **tripled** in these wards. In ward 5, the EBL % increased from 4.9% to 15.7% ($p=0.038$). The area of intersection between wards 3, 4, and 5 (in the east side of the city) also appeared high. Lastly, ward 7 had high pre and post-levels EBL% above 5% (specifically in the western portion of the ward).

Of note, our results continue to correlate with the high water lead levels from the Virginia Tech samples. Most notably, the high percentage of EBL% in wards 5, 6, and 7 also correspond with the high water lead levels in wards 5, 6, and 7.

Mona Hanna-Attisha MD MPH FAAP

Program Director Pediatric Residency

Hurley Children's Hospital at Hurley Medical Center

Michigan State University College of Human Medicine

Department of Pediatrics and Human Development

Mhanna1@hurleymc.com

From: [Peeler, Nancy \(DHHS\)](#)
To: [Miller, Corinne \(DHHS\)](#); [Miller, Mark \(DHHS\)](#); [LyonCallo, Sarah \(DHHS\)](#); [Dykema, Linda D. \(DHHS\)](#); [Priem, Wesley F. \(DHHS\)](#); [Travis, Rashmi \(DHHS\)](#); [Wells, Eden \(DHHS\)](#)
Subject: FW: Hurley -- follow up about the question on Hurley lab results
Date: Wednesday, September 30, 2015 5:22:20 PM

Hi all – I talked to Bob to confirm the information I had shared about the Hurley lab results. It is a little more nuanced than I had explained, forwarding Bob's explanation, FYI.

From: Scott, Robert L. (DCH)
Sent: Wednesday, September 30, 2015 5:05 PM
To: Peeler, Nancy (DCH)
Subject: Hurley

Hurley Medical Center is listed as the "Provider" on approximately half of the blood lead results we received for Flint children in 2014—I assume that pattern holds in 2015 and in recent years. Warde Medical Lab is listed as the "Laboratory" on those results. Warde reported the results to CLPPP in accordance with State law.

I can't say whether the blood specimens were a) drawn at Hurley's lab, or b) simply passed through Hurley's lab—from physician office to Hurley to Warde for analysis. As I understand it, both scenarios are common at various hospital labs.

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: [Miller, Corinne \(DCH\)](#)
To: [LyonCallo, Sarah \(DCH\)](#); [Dykema, Linda D. \(DCH\)](#)
Subject: FW: Flint lead powerpoint slides
Date: Tuesday, September 29, 2015 12:07:52 PM

From: Wells, Eden (DCH)
Sent: Tuesday, September 29, 2015 11:56 AM
To: Lasher, Geralyn (DCH); Peeler, Nancy (DCH); Scott, Robert L. (DCH)
Cc: Hertel, Elizabeth (DCH); Minicuci, Angela (DCH); Ridley, Nancy (DCH); Eisner, Jennifer (DCH); Miller, Corinne (DCH)
Subject: Re: Flint lead powerpoint slides
Looping in Corinne now---

From: Lasher, Geralyn (DCH)
Sent: Tuesday, September 29, 2015 11:49 AM
To: Peeler, Nancy (DCH); Wells, Eden (DCH); Scott, Robert L. (DCH)
Cc: Hertel, Elizabeth (DCH); Minicuci, Angela (DCH); Ridley, Nancy (DCH); Eisner, Jennifer (DCH)
Subject: RE: Flint lead powerpoint slides
Is it possible to get the same type of data for just children under the age of six? So basically, the City of Flint kids ages six and under with the same type of approach as the attached chart you gave us last week?

From: Peeler, Nancy (DCH)
Sent: Thursday, September 24, 2015 3:40 PM
To: Eisner, Jennifer (DCH) <EisnerJ@michigan.gov>
Cc: Lasher, Geralyn (DCH) <lasherg@michigan.gov>; Hertel, Elizabeth (DCH) <HertelE@michigan.gov>; Scott, Robert L. (DCH) <ScottR9@michigan.gov>; Minicuci, Angela (DCH) <MinicuciA@michigan.gov>; Ridley, Nancy (DCH) <RidleyN@michigan.gov>
Subject: Re: Flint lead powerpoint slides
Yes, fine if you all are ok with it.
Nancy

Sent from my iPhone

On Sep 24, 2015, at 3:36 PM, Eisner, Jennifer (DCH) <EisnerJ@michigan.gov> wrote:

Geralyn and Elizabeth – waiting on final OK from Nancy before sharing publicly..

From: Scott, Robert L. (DCH)
Sent: Thursday, September 24, 2015 3:31 PM
To: Eisner, Jennifer (DCH) <EisnerJ@michigan.gov>

Cc: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>; Peeler, Nancy (DCH) <PeelerN@michigan.gov>

Subject: RE: Flint lead powerpoint slides

OK with me if it's OK with Nancy.

From: Eisner, Jennifer (DCH)
Sent: Thursday, September 24, 2015 3:29 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Cc: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>; Peeler, Nancy (DCH)

[<PeelerN@michigan.gov>](mailto:PeelerN@michigan.gov)

Subject: RE: Flint lead powerpoint slides

Great, thanks Bob – can we make this available to the public?

From: Scott, Robert L. (DCH)

Sent: Thursday, September 24, 2015 3:27 PM

To: Eisner, Jennifer (DCH) <EisnerJ@michigan.gov>

Cc: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>; Peeler, Nancy (DCH) <PeelerN@michigan.gov>

Subject: Flint lead powerpoint slides

Jennifer,

Nancy asked me to put this together, in case it's helpful. Please see attached.

Bob

Robert L. Scott

Childhood Lead Poisoning Prevention Program

Michigan Department of Health & Human Services

(517) 335-8178

fax (517) 335-8509

Message

From: Garcia, Deborah (DHHS) [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=A1CC44FB10244EC99C28E57257FAC75D-GARCIA DEBORAH]
Sent: 12/17/2015 10:09:25 PM
To: Lyon, Nick (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=cc8bf601f48844a2b44c7e1bda929e38-Lyon Nick]
CC: Grijalva, Nancy (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=16a1b77d7da74e3ba968074c67c5c8aa-Houts Nancy]; Rick, Matthew (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=72a2a08f22bb4209a513defa438bf5cc-Rick Matthew]; Waggoner, Carrie (DHHS) [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dc21e6f9ad1e4ed499564b6bf9823e16-Waggoner Carrie]
Subject: 2015-557 Marc Edwards-Flint Water Responsive Documents Part 5
Attachments: FOIA 2015-557 RedactedResponsiveDocs.zip
Importance: High

Nick,

See attached Part 5.

Debbie

Deborah R. Garcia, JD, MAHS

Public Health Administrative Law Specialist

Michigan Department of Health and Human Services

Office of Legal Affairs

Capitol View Building, 7th fl.

201 Townsend Street

Lansing, MI 48913

Direct Line: 517-241-3374

Fax: 517-241-1200

Garcia.d2@michigan.gov

information contained in this e-mail is expressly prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy any and all copies of the original message."

This Document is a Non-Responsive Attachment.

Scott, Robert L. (DHHS)

From: Larder, Cristin (DCH)
Sent: Tuesday, July 28, 2015 4:54 PM
To: Scott, Robert L. (DCH); Peeler, Nancy (DCH)
Cc: LyonCallo, Sarah (DCH); McKane, Patricia (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx
Attachments: City of Flint EBLL May 2011-Apr 2015_Final.pdf

Hello Nancy and Bob,

It turns out that adding in the additional two years of data did not change the results of the analysis: there does appear to be a higher proportion of EBLL last summer than usual. I wrote up my methods and results in the attached brief, just in case anyone asks for specifics.

Have a good night!

Cristin

From: Scott, Robert L. (DCH)
Sent: Tuesday, July 28, 2015 10:15 AM
To: Larder, Cristin (DCH); Peeler, Nancy (DCH); McKane, Patricia (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx

Cristin,

I can safely say I don't understand it without some explanation.

However, late yesterday Nancy and I decided to take a look two years farther back to see how they fit with the recent years. Please see attached, which I just finished this morning. Sorry I didn't have this for you yesterday before you did the analysis. Would this new information change the analysis?

Thanks,
Bob

From: Larder, Cristin (DCH)
Sent: Tuesday, July 28, 2015 10:07 AM
To: Peeler, Nancy (DCH); McKane, Patricia (DCH)
Cc: Scott, Robert L. (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx

Nancy and Bob,

Is the control chart clear enough, do you think? I could whip up a fact sheet with a description of what it shows, if you think it would help make it more digestible for our audience.

Cristin

From: Larder, Cristin (DCH)
Sent: Tuesday, July 28, 2015 9:25 AM
To: Peeler, Nancy (DCH); McKane, Patricia (DCH)

Cc: Scott, Robert L. (DCH)
Subject: RE: Flint Testing and EBLLs.xlsx

Hi Nancy,

I made a p-chart, which Shewhart's version of a control chart for proportions, for the data you sent. Basically, I used the monthly data from 2013-14 to create upper and lower control limits, then plotted the 2014-15 data in a run chart. It shows that the three months in question are the only ones that lie outside the control limit: in fact, they are the only points that lie well above the mean at all. This doesn't say anything about causality, but it does warrant further investigation.

There are several next steps we can employ if the folks upstairs ask us to look deeper into the data. Also, I'm not sure if you talked at all with the Environmental Health folks, but their toxicologists could probably help give us some context to the issue.

Cristin

From: Peeler, Nancy (DCH)
Sent: Monday, July 27, 2015 3:37 PM
To: McKane, Patricia (DCH)
Cc: Larder, Cristin (DCH); Scott, Robert L. (DCH)
Subject: Re: Flint Testing and EBLLs.xlsx

Thanks, Patti. I'm looking forward to hearing about your CollN meeting, I'm sure you will be bringing great information back.

Sent from my iPhone

On Jul 27, 2015, at 3:11 PM, "McKane, Patricia (DCH)" <McKaneP@michigan.gov> wrote:

Thanks Nancy.

I was in a session on Shewart charts for QI. I think this might be a good approach for the needs assessment - We can talk more. Hopefully the slides will be available, because I can't type that much with my thumbs

Sent from my iPhone

On Jul 27, 2015, at 1:14 PM, Peeler, Nancy (DCH) <PeelerN@michigan.gov> wrote:

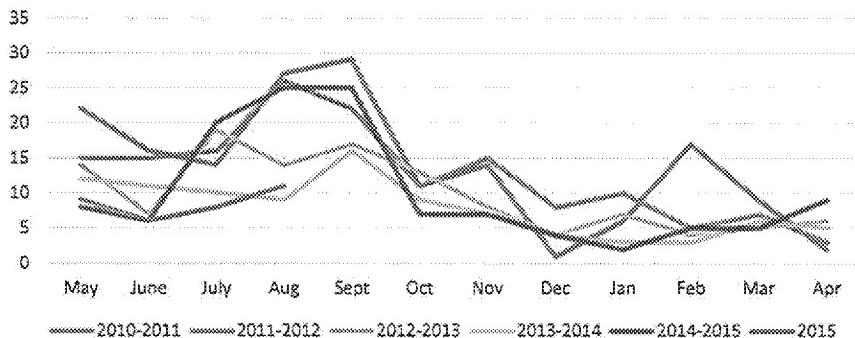
Hi Cristin and Patti –

This is the CLPPP data for Flint that I had mentioned to you last week. Cristin, can you quickly run any tests to see if the difference in the first graph is statistically significant? Bob is at his desk today, best to connect with him if you have questions about the data. We are hoping to send this up today, so we appreciate anything you can do to get us a response this afternoon, if at all possible. Many thanks!

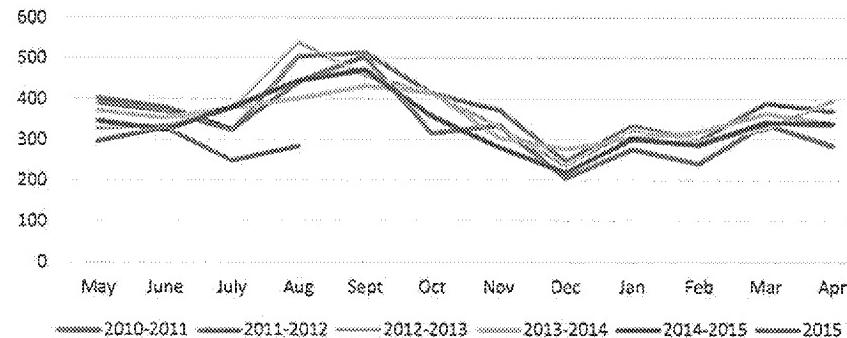
Nancy

<Flint Testing and EBLLs.xlsx>

City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels*



City of Flint, Children less than 16 years of age
Tested for Lead Poisoning



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	22	16	14	27	29	11	14	1	6	17	9	2
2011-2012	15	15	16	26	22	11	15	8	10	5	7	3
2012-2013	14	7	19	14	17	13	8	4	7	4	5	6
2013-2014	12	11	10	9	16	9	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	4	2	5	5	9
2015	9	6	8	11								

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	402	379	325	442	504	315	335	206	276	240	338	285
2011-2012	390	370	324	503	512	413	372	248	333	298	389	370
2012-2013	328	335	376	540	458	416	331	237	325	298	325	397
2013-2014	371	353	378	401	432	414	305	277	304	319	363	339
2014-2015	346	324	379	445	471	357	281	219	301	287	342	337
2015	297	330	249	284								

*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

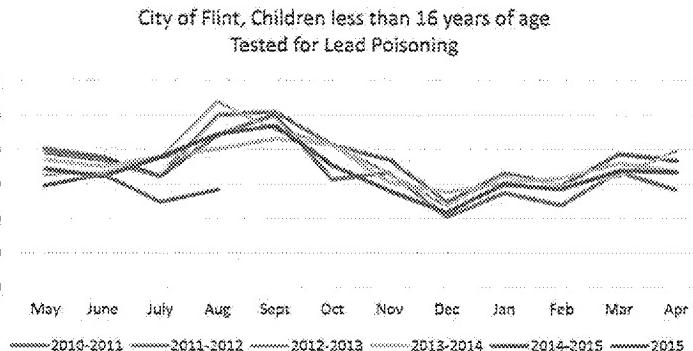
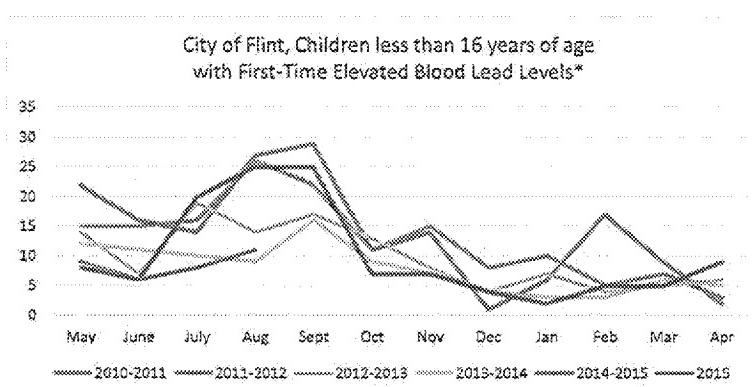
Less than 16 years of age at time of test

Includes only first-time blood lead levels $\geq 5 \text{ ug/dL}$

Includes sample type of venous, capillary or unknown

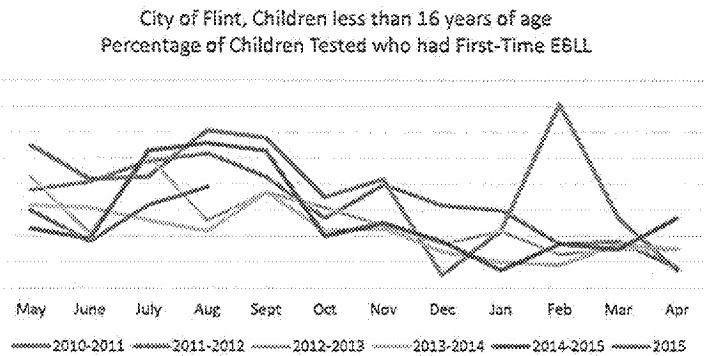
September 23, 2015

Source: MDHHS Data Warehouse, Lead Specimen table



*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits
Less than 16 years of age at time of test
Includes only first-time blood lead levels ≥ 5 ug/dL
Includes sample type of venous, capillary or unknown

Source: MDHHS Data Warehouse, Lead Specimen table



Children Tested for Blood Lead Before and After the Change in Flint's Water Supply

Hurley tests only
 (Provider ID = 00000252)

	Children Tested	Children with elevated blood lead levels											
		(Hurley analysis)				Venous only				All (V, C, unknown)			
		Children		Tested	Pct >= 6	BLL >= 5	Pct >= 5	BLL >= 6	Pct >= 6	BLL >= 5	Pct >= 5	BLL >= 6	Pct >= 6
January 1 - September 15, 2013	1177	906	2.1	24	2.0	8	0.7	41	3.5	19	1.6		
January 1 - September 15, 2015*	966	840	4.0	29	3.0	21	2.2	39	4	28	2.9		

All Providers

	Children Tested	Children with elevated blood lead levels											
		Venous only				All (V, C, unknown)							
		BLL >= 5	Pct >= 5	BLL >= 6	Pct >= 6	BLL >= 5	Pct >= 5	BLL >= 6	Pct >= 6				
January 1 - September 15, 2013	2380	33	2.8	16	1.4	86	7.3	44	3.7				
January 1 - September 15, 2015*	1928	40	4.1	28	2.9	80	8.3	54	5.6				

Notes:

Children 0 - 5 years of age

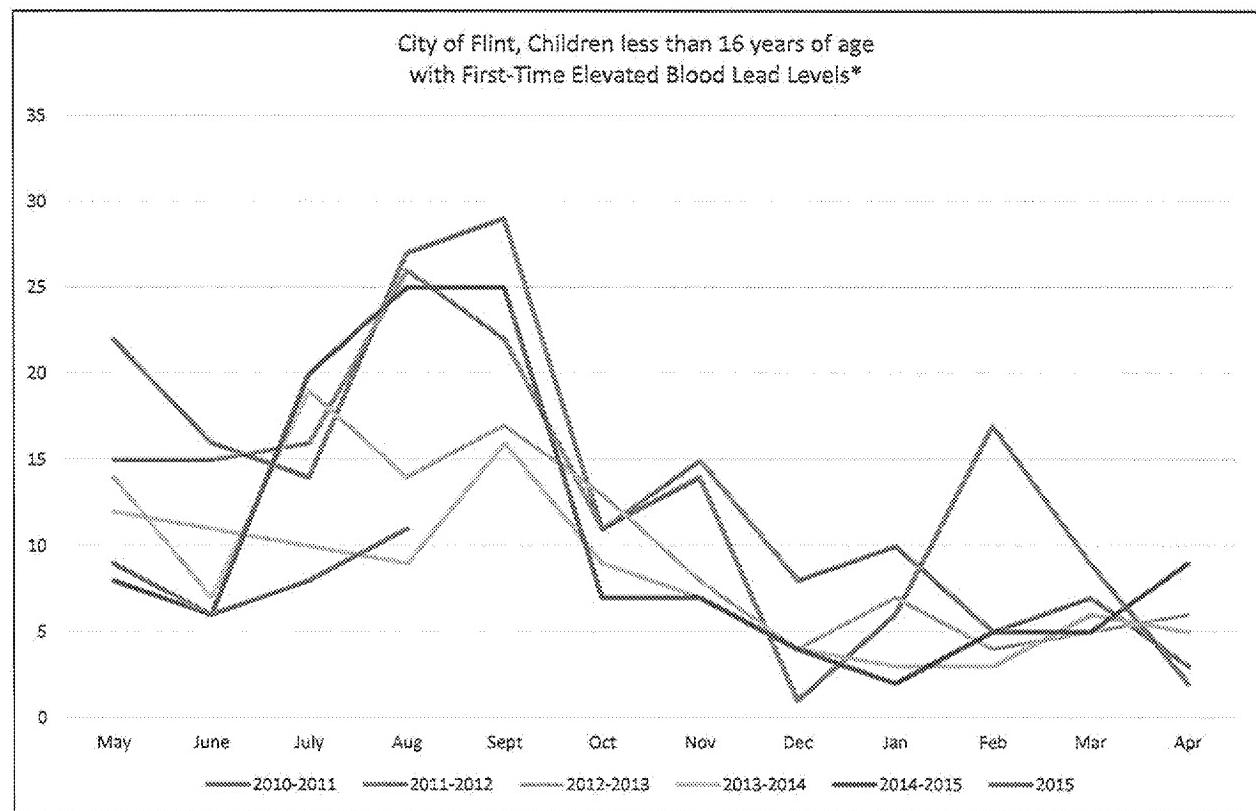
Children living in zip codes 48501 -48507

Source: MDHHS Data Warehouse

September 24, 2015

Blood Lead Testing of Children in Flint, Before and After the Change in Flint's Water

- The change in Flint's water source occurred in April 2014. MDHHS looked at children's blood lead levels (BLL) before and after this event.
- The dark blue line (May 2014 – April 2015) and the green line (May-August 2015) reflect children's blood lead tests after the change. All other lines reflect tests before the change.
- An increase in childhood lead poisoning in summer (July, August, September) is typical throughout Michigan every year.
- While there is a dramatic difference between the numbers of elevated BLL in the summer before and after the event, a wider look that includes data back to 2010 shows that the year BEFORE the event (the yellow line) was more of an anomaly than the year after (the dark blue line).
- If elevated BLL were being driven by the change in water, we would expect the dark blue line to stay high rather than follow the seasonal pattern.
- All data included in this analysis were reported by laboratories directly to MDHHS, in accordance with State law.



*This graph includes:

Children whose address is listed as "Flint"--may not conform exactly to Flint city limits

Children less than 16 years of age at time of test

Only first-time blood lead levels ≥ 5 ug/dL

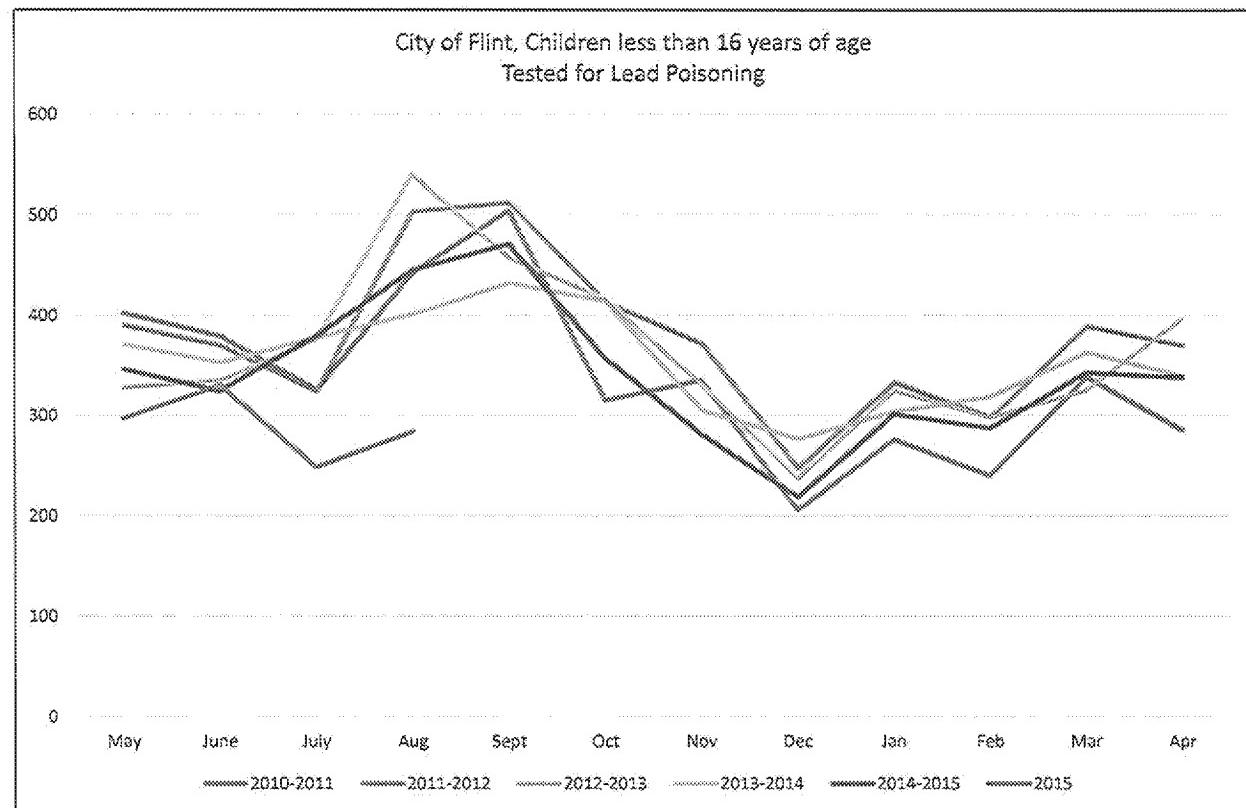
All first-time elevated levels, regardless of sample type (venous, capillary or unknown)

September 24, 2015

Source: MDHHS Data Warehouse,
Lead Specimen table

Blood Lead Testing of Children in Flint, Before and After the Change in Flint's Water

- Blood lead testing (regardless of elevated levels) also tends to rise during late summer (August, September, October).
- This graph shows that testing in Flint has remained fairly steady over the last five years, except for a recent decline (May – August 2015).



*This graph includes:

Children whose address is listed as "Flint"—may not conform exactly to Flint city limits

Children less than 16 years of age at time of test

The number of children tested within each month.

Some children are tested more than once, and may be included in more than one month or year.

September 24, 2015

Source: MDHHS Data Warehouse,
Lead Specimen table

Children in Flint, less than 16 years of age, tested for lead

Children with Elevated BLL*

May 2010 - April 2011	168
2011-2012	153
2012-2013	118
2013-2014	95
2014-2015	123
May - August 2015	34

Children Tested**

May 2010 - April 2011	3,836
2011-2012	4,240
2012-2013	4,158
2013-2014	4,010
2014-2015	3,831
May - August 2015	1,143

*Each child counted only once.

**Some children counted in more than one year.

September 24, 2015

Source: MDHHS Data Warehouse

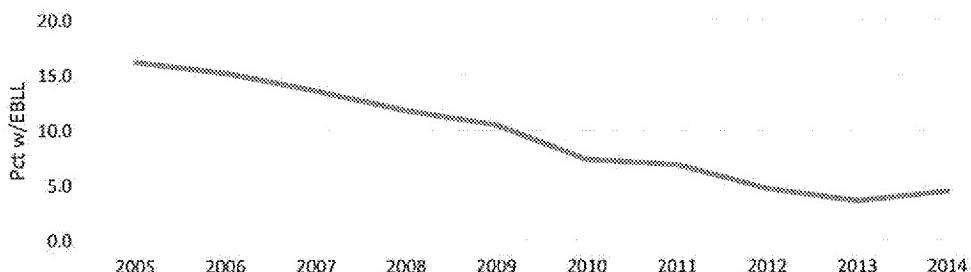
37.

Percentage of Children age 0-5 with Elevated Blood Lead Levels by Calendar Year

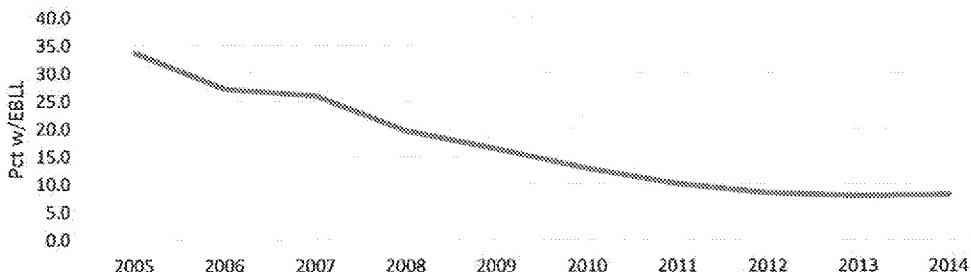
Calendar Year	Flint			Detroit			Michigan		
	Number of Children		Pct >= 5*	Number of Children		Pct >= 5*	Number of Children		Pct >= 5*
	Tested	>= 5*	Pct >= 5*	Tested	>= 5*	Pct >= 5*	Tested	>= 5*	Pct >= 5*
2005	3,076	499	16.2	32,704	11,032	33.7	132,913	22,843	17.2
2006	3,207	488	15.2	33,190	9,019	27.2	141,011	20,063	14.2
2007	2,950	401	13.6	33,010	8,571	26.0	149,445	19,496	13.0
2008	2,372	279	11.8	32,105	6,326	19.7	153,248	15,041	9.8
2009	2,321	244	10.5	31,969	5,266	16.5	154,291	13,161	8.5
2010	2,876	212	7.4	30,812	3,999	13.0	155,847	9,762	6.3
2011	2,349	162	6.9	28,674	2,928	10.2	151,867	7,547	5.0
2012	2,375	111	4.7	27,298	2,327	8.5	149,046	6,772	4.5
2013	2,345	85	3.6	25,026	1,996	8.0	147,841	5,702	3.9
2014	2,343	106	4.5	22,842	1,876	8.2	143,123	5,053	3.5

*Confirmed and unconfirmed

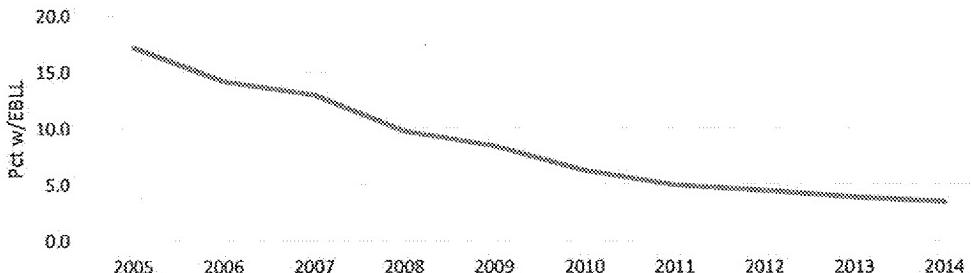
Flint



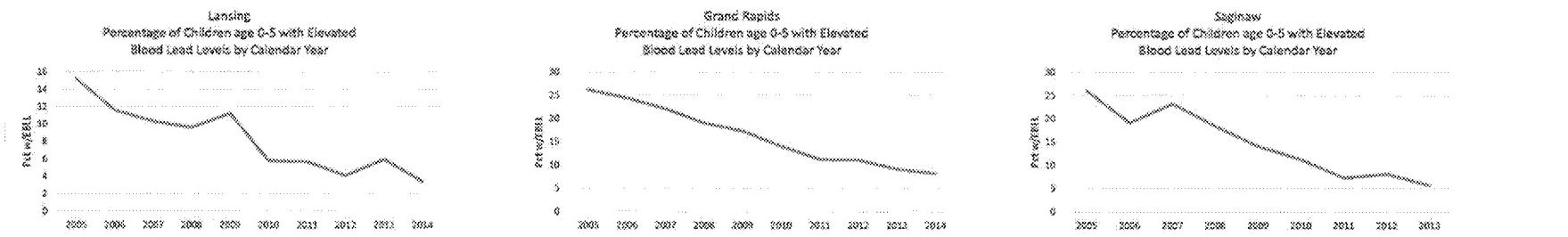
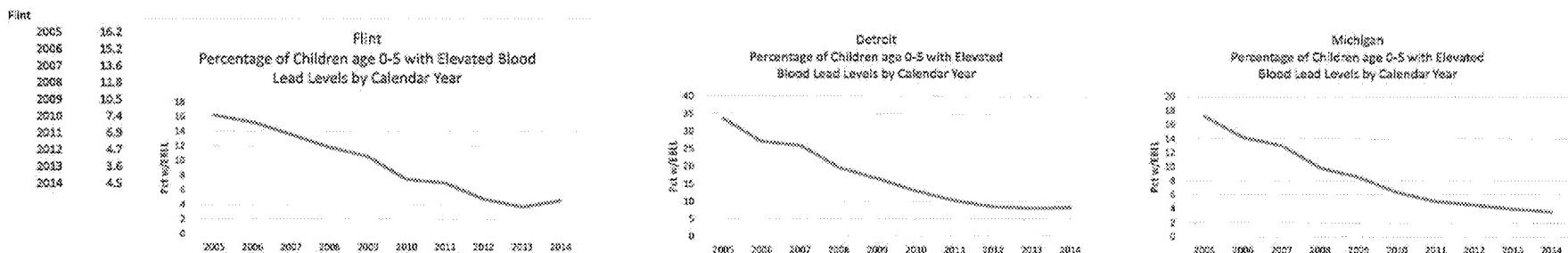
Detroit



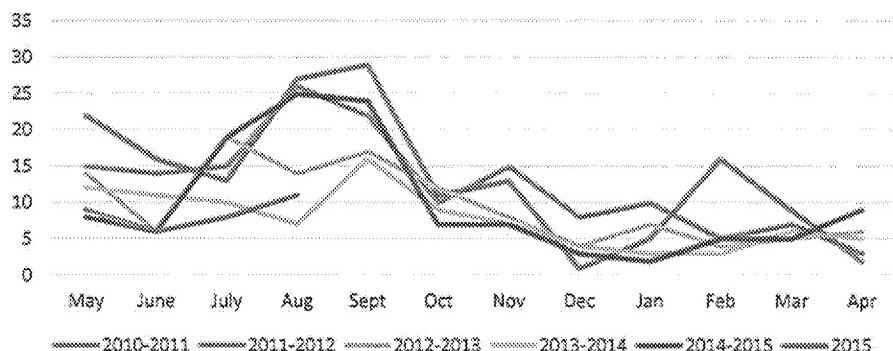
Michigan



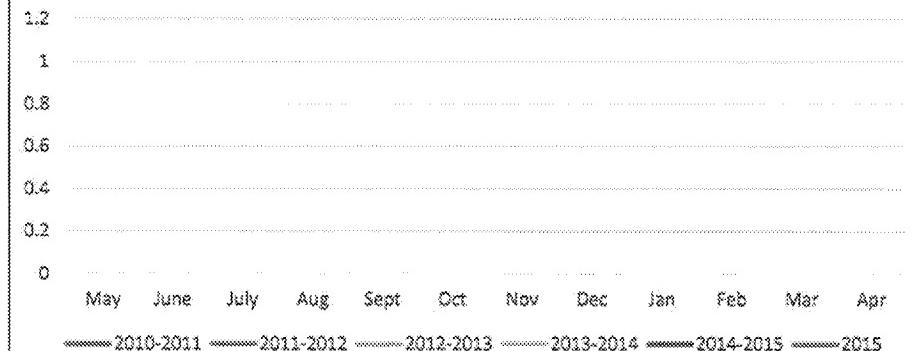
Plant	C & Conf & Unconf			Pct Conf & Unconf			Detroit			Michigan			Lansing			Grand Rapids			Saginaw		
	Children	n	%	Children	n	%	Children	n	%	Children	n	%	Children	n	%	Children	n	%	Children	n	%
	Tested			Tested	rm	of 5	Tested	rm	%	Tested	rm	%	Tested	rm	%	Tested	rm	%	Tested	rm	%
2005	3076	459	16.2	32784	11032	33.7	133303	22843	17.2	1934	284	15.1	5530	1447	36.3	1763	458	26			
2006	3207	488	15.2	33190	9019	27.3	141611	20063	14.2	2912	381	11.6	5334	1299	24.4	1721	325	19.1			
2007	2959	401	13.6	33810	8571	26	149485	19466	13	3539	366	10.3	4976	1100	22.1	1723	400	23.3			
2008	2372	279	11.8	32205	6326	19.7	153348	15041	9.8	3330	321	9.6	4296	818	19	1687	313	18.4			
2009	2321	348	13.5	31260	5206	16.5	154291	12361	8.8	3522	393	11.2	4084	708	17.3	1613	228	14.1			
2010	2876	232	7.4	30812	3999	13	155847	9762	8.8	3375	196	5.8	4959	688	14.1	1828	207	11.3			
2011	2249	152	6.9	28674	2928	10.2	153387	7547	5	3328	178	5.2	5185	579	11.3	1702	125	7.3			
2012	2375	113	4.7	27288	2327	8.5	149048	6772	4.5	3121	139	4.3	4278	540	11.1	1628	132	8.1			
2013	2345	85	3.6	25026	3996	8	147841	5702	3.9	3135	127	6	4639	426	9.2	1550	88	5.7			
2014	2343 # 3	106	4.5	23842 # 7	3876	8.3	143123 # 2	5393	3.5	2995	103	3.4	4379	359	8.2						



**City of Flint, Children less than 6 years of age
with First-Time Elevated Blood Lead Levels***



**City of Flint, Children less than 6 years of age
Tested for Lead Poisoning**



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011	22	16	13	27	29	11	13	1	5	16	9	2
2011-2012	15	14	15	26	22	10	15	8	10	5	7	3
2012-2013	14	6	19	14	17	12	8	4	7	4	5	6
2013-2014	12	11	10	7	16	9	7	4	3	3	6	5
2014-2015	8	6	19	25	24	7	7	3	2	5	5	9
2015	9	6	8	11								

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2010-2011												
2011-2012												
2012-2013												
2013-2014												
2014-2015												
2015												

*Children whose address is listed as "Flint"--may not conform exactly to Flint city limits
Less than 16 years of age at time of test
Includes only first-time blood lead levels ≥ 5 ug/dL
Includes sample type of venous, capillary or unknown

September 30, 2015

Source: MDHHS Data Warehouse, Lead Specimen table

Follow-up for Children in Flint (ZIPs 48501-48507) with Elevated Blood Lead Levels April 2014 through March 2015

Children with Initial Confirmed (Venous) Elevated BLL 5-14

Children w/BLL 5-14:	43
With retest:	14
Most recent retest was <5:	4
5 to 14:	9
>= 15:	1

Children with Initial Confirmed (Venous) Elevated BLL >= 15

Children w/BLL >= 15:	3
With retest:	1
Most recent retest was <5:	0
5 to 14:	0
>= 15:	1

Children with Initial Capillary Elevated BLL 5-14 (needing confirmation)

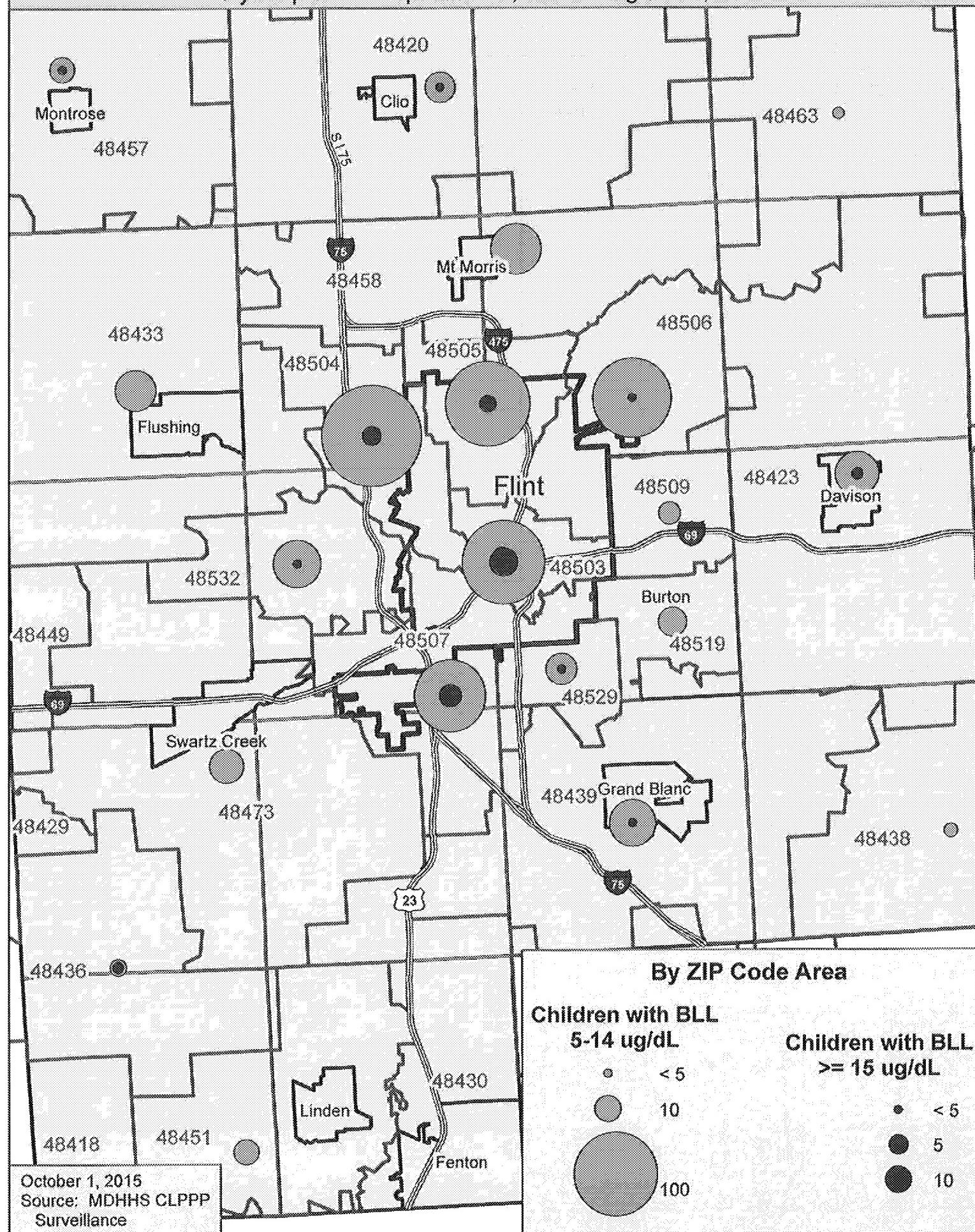
Children w/BLL 5-14:	70
With confirmatory venous:	15
Confirmatory test was <5:	7
5 to 14:	7
>= 15:	1

Children with Initial Capillary Elevated BLL >= 15 (needing confirmation)

Children w/BLL >= 15:	1
With confirmatory venous:	0

Children with Elevated Blood Lead Levels in Genesee County, by ZIP Code Area

5-year period: September 1, 2010 - August 31, 2015



Children in Genesee County, Tested for Lead Poisoning, by Blood Lead Level

Most Recent 12-Month Period: September 1, 2014 - August 31, 2015

	0 - 4 ug/dL	5 - 14 ug/dL Confirmed*	5 - 14 ug/dL Not Confirmed*	15 - 44 ug/dL Confirmed*	15 - 44 ug/dL Not Confirmed*	>= 45 ug/dL
Flint ZIPS (48501-48507)	2,721	49	53	5	**	0
Genesee County (all ZIPs)	6,086	58	94	6	**	0

Most Recent Five-Year Period: September 1, 2010 - August 31, 2015

	0 - 4 ug/dL	5 - 14 ug/dL Confirmed*	5 - 14 ug/dL Not Confirmed*	15 - 44 ug/dL Confirmed*	15 - 44 ug/dL Not Confirmed*	>= 45 ug/dL
Flint ZIPS (48501-48507)	11,596	287	219	24	**	0
Genesee County (all ZIPs)	26,362	359	415	29	9	0

*One test per child is included in each table: the highest venous result, or if no venous, then the highest capillary result.

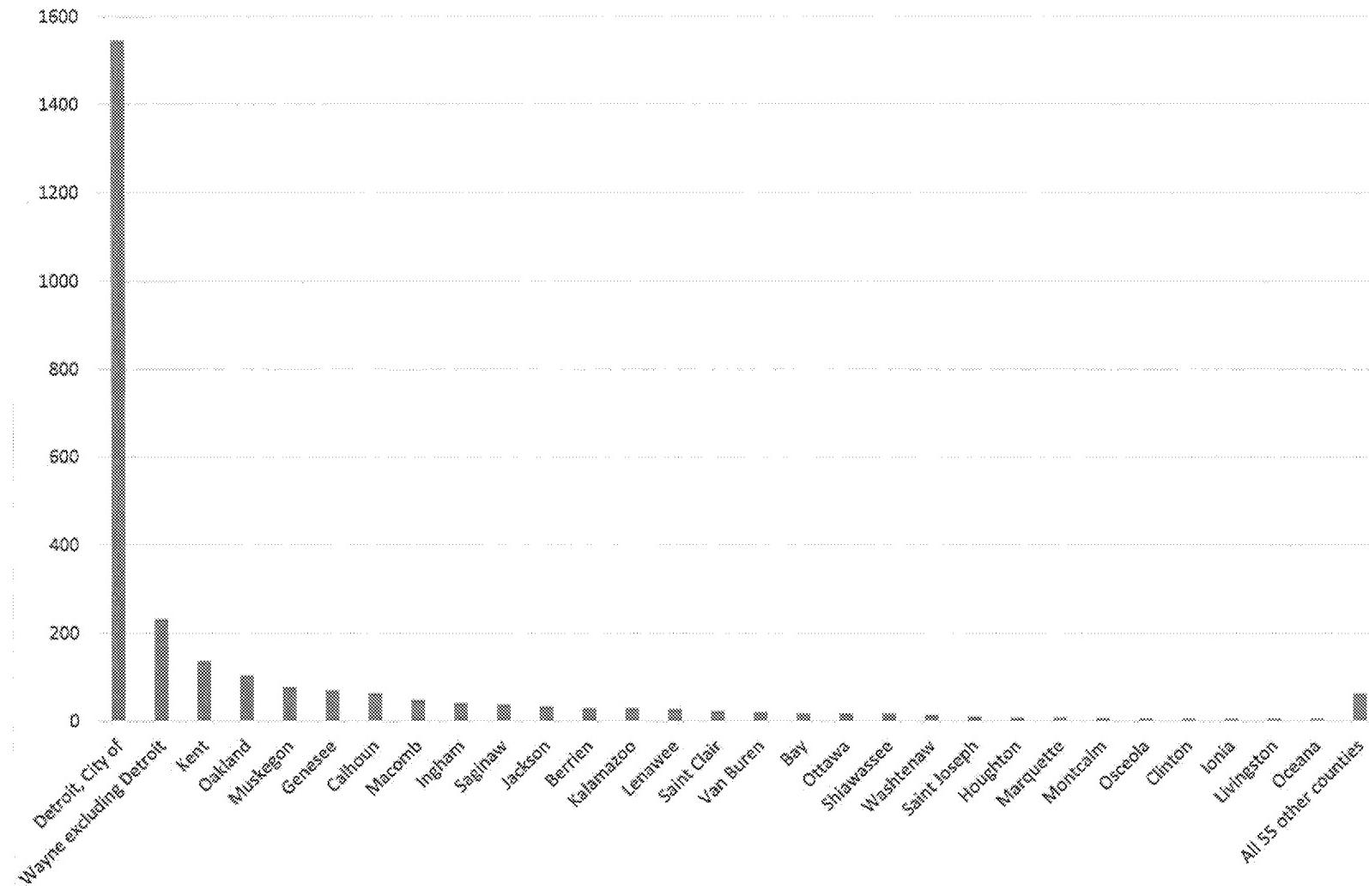
Only venous tests are considered to be "confirmed."

**Suppressed (N<5)

October 1, 2015

Source: MDHHS CLPPP Surveillance

Children with Confirmed Elevated Blood Lead Levels ($\geq 5 \mu\text{g}/\text{dL}$) in CY 2014
by County and Detroit City



October 1, 2015

Source: MDHHS Data Warehouse

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Tuesday, September 08, 2015 4:19 PM
To: 'Marc Edwards'
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.
Attachments: DCH-1294 Data Use and Non-Disclosure Agreement 5-2015.doc

Marc,

Sorry I'm slow to get back to you. Yes, I think this sounds great. There has been some concern about the water source change in Flint, and in fact we had a call about it today. Yes, this will need a new data sharing agreement. Please fill out the attached and send back to me, leaving it as a Word document without signature. I'll run it past Legal, and they'll no doubt ask for a couple of changes.

Thanks,
Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Wednesday, September 02, 2015 8:36 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Hi Robert,

I would like to repeat the study I did below, but updated for Flint Michigan, Genesee County Michigan, and Detroit. What I need is blood lead data from all Flint zip codes, Genesee County zip codes and Detroit zip codes from 2011 to present. Please do not identify the records by name, but have an ID code for each individual that can be sorted, along with the date of the measurement, blood lead result, zip code in which the child resides, and child's birth date so I can determine the age of the subject.

The intervention of interest, is the change from Detroit water to Flint River water, in Flint Michigan. Genesee County and Detroit serve as control data sets.

If it can be provided in a format that can be read into EXCEL, that would be best.

Let me know if you need a new signed data sharing agreement, or whether our agreement from 2006 is still ok.

Best Regards,
Marc Edwards

Date: Fri, 17 Nov 2006 15:41:55 -0500
To: "Robert L. Scott" <scottrob@michigan.gov>
From: Marc Edwards <edwardsm@vt.edu>
Subject: Proposal and signed data agreement

Robert,

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This is a fairly straightforward test that I suspect will confirm that no significant change arose due to the intervention in Lansing, consistent with water as a minor contributor to blood lead in Lansing.

If you should have additional questions please e-mail me at this address or call me at 540 231-7236,

Regards,
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Attachments: DCH-1294 Data Use and Non-Disclosure Agreement 5-2015.doc; 94 DC_Water_Lead_Edwards_2009.pdf; Rapid Proposal Final.pdf

Here you go.

Best Regards,
Marc

From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Tuesday, September 08, 2015 7:55 AM
To: Marc Edwards
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Yes, sorry for the delay; I'll get you a more complete answer later today.

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Monday, September 07, 2015 11:40 AM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: FW: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

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Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:09 PM
To: Peeler, Nancy (DCH); 'Lishinski Karen (LishinskiK@michigan.gov)'; Priem, Wesley F. (DCH)
Subject: Flint water study
Attachments: Rapid Proposal Final.pdf

Nancy, Karen and Wes,

I'm passing this along as follow-up to our previous attention to the Flint water changeover situation. The attached was submitted to me along with a request for de-identified data, which should be no problem.

When you have a few minutes you might want to take a look at it. Sounds like there might be more to this than what we learned previously. Yikes!

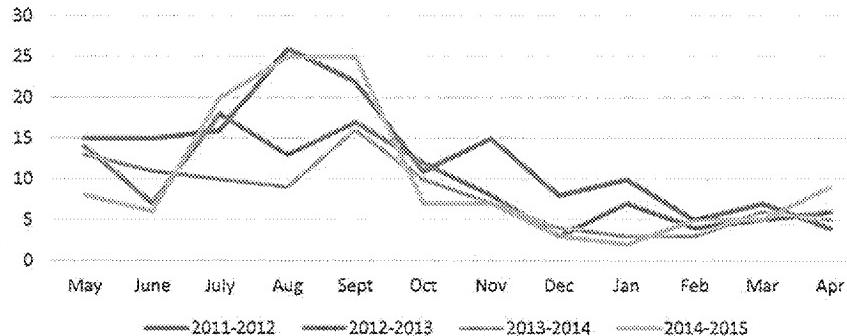
Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

Pending Data Sharing
Agreements

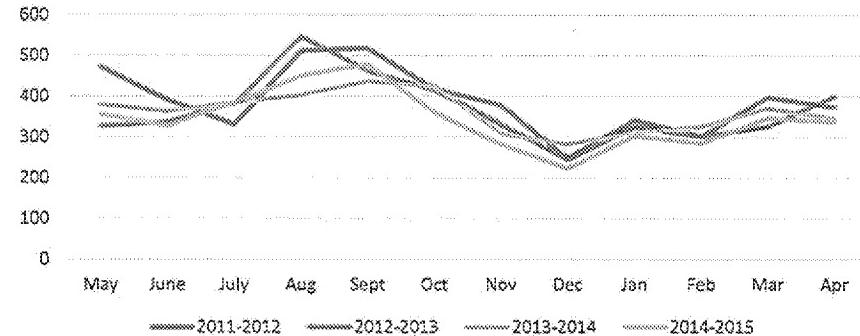
Organization/Individual	Date Initiated	Have I responded?	Status	IRB Status	Date last action	MOU developed?	
Center for Urban Studies	6/2/2015	yes	discussed with Colin		7/2/2015	no	
ClearCorp	6/4/2015	yes	discussed with Colin		7/2/2015	no	
Gazze/MIT	6/3/2015	yes	discussed with Colin		7/2/2015	no	
DDD	6/8/2015	yes	discussed with Colin		8/11/2015	no	
Moody & Grady, MSU	6/23/2015	yes	resubmitted to Colin		8/25/2015	no	Sent feedback to Heather, asking for revised DCH-1204 and letter, MSU IRB app, and MDCH IRB app.
Tanska/Yutka	8/5/2015	yes	submitted to Colin		8/27/2015	no	Nudge Colin when you get IRB response.
McElmurry, WSU	9/8/2015	yes	returned to McElmurry		9/9/2015	no	
Edwards, Virginia Tech	9/7/2015	yes					request was withdrawn
Hanne-Atusha, Hurley	9/22/2015	yes	Approved	Approved	10/2/2015	no	Data sent

8/25/15
made a

City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels



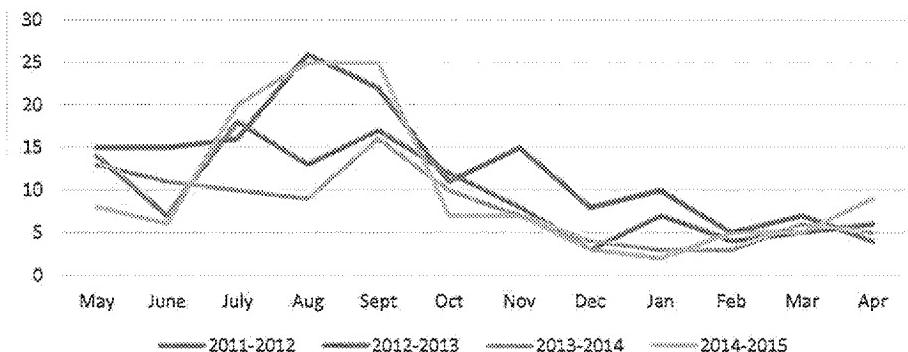
City of Flint, Children less than 16 years of age
Tested for Lead Poisoning



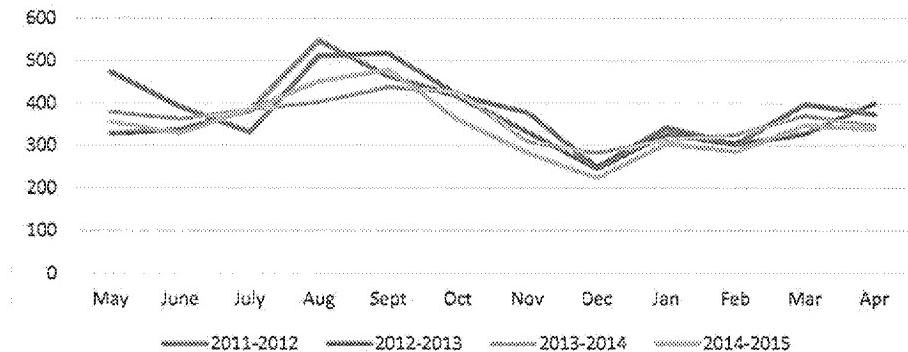
	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2011-2012	15	15	16	26	22	11	15	8	10	5	7	4
2012-2013	14	7	18	13	17	12	8	3	7	4	5	6
2013-2014	13	11	10	9	16	10	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	3	2	5	5	9

	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2011-2012	474	393	332	513	520	420	379	249	343	303	399	375
2012-2013	328	338	383	550	464	417	332	246	328	303	328	402
2013-2014	380	363	385	404	438	427	310	283	313	325	371	346
2014-2015	356	329	386	452	480	361	283	224	305	287	348	339

**City of Flint, Children less than 16 years of age
with First-Time Elevated Blood Lead Levels**



**City of Flint, Children less than 16 years of age
Tested for Lead Poisoning**



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
2011-2012	15	15	16	26	22	11	15	8	10	5	7	4
2012-2013	14	7	18	13	17	12	8	3	7	4	5	6
2013-2014	13	11	10	9	16	10	7	4	3	3	6	5
2014-2015	8	6	20	25	25	7	7	3	2	5	5	9

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2013-2014	380	363	385	404	438	427	310	283	313	325	371	346
2014-2015	356	329	386	452	480	361	283	224	305	287	348	339

Date	Elevated	Tested	Proportion	Mean P	P LCL	P UCL
May-13	13	380	0.034	0.022	0	0.04
Jun-13	11	363	0.030	0.022	0.00	0.04
Jul-13	10	385	0.026	0.022	0.00	0.04
Aug-13	9	404	0.022	0.022	0.00	0.04
Sep-13	16	438	0.037	0.022	0.00	0.04
Oct-13	10	427	0.023	0.022	0.00	0.04
Nov-13	7	310	0.023	0.022	0.00	0.04
Dec-13	4	283	0.014	0.022	0.00	0.04
Jan-14	3	313	0.010	0.022	0.00	0.04
Feb-14	3	325	0.009	0.022	0.00	0.04
Mar-14	6	371	0.016	0.022	0.00	0.04
Apr-14	5	346	0.014	0.022	0.00	0.04
May-14	8	356	0.022	0.022	0.00	0.04
Jun-14	6	329	0.018	0.022	0.00	0.04
Jul-14	20	386	0.052	0.022	0.00	0.04
Aug-14	25	452	0.055	0.022	0.00	0.04
Sep-14	25	480	0.052	0.022	0.00	0.04
Oct-14	7	361	0.019	0.022	0.00	0.04
Nov-14	7	283	0.025	0.022	0.00	0.04
Dec-14	3	224	0.013	0.022	0.00	0.04
Jan-15	2	305	0.007	0.022	0.00	0.04
Feb-15	5	287	0.017	0.022	0.00	0.04
Mar-15	5	348	0.014	0.022	0.00	0.04
Apr-15	9	339	0.027	0.022	0.00	0.04

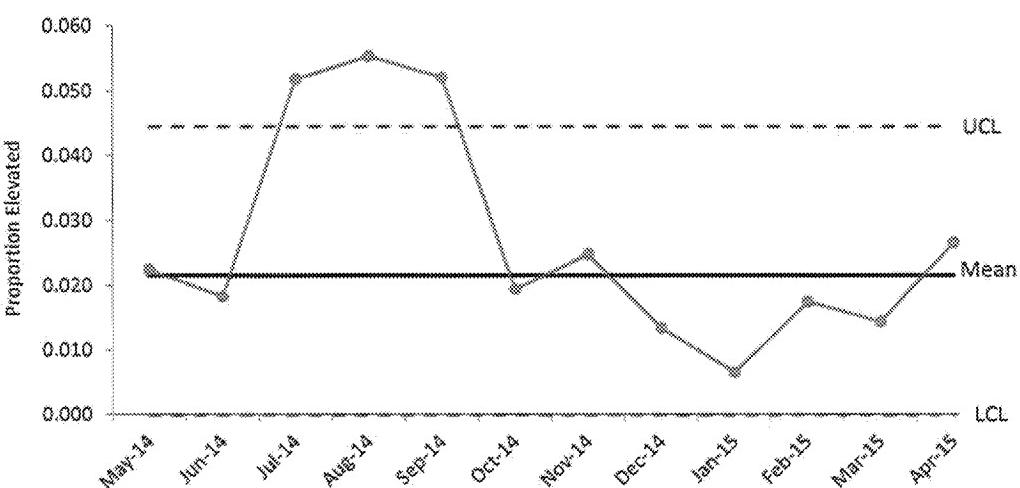
2013/14
Mean P = 0.022
Mean n = 362.08

\hat{p} -chart

$$UCL = \bar{p} + 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

$$\text{Center Line: } \bar{p}$$

$$LCL = \bar{p} - 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$



Scott, Robert L. (DHHS)

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Sent: Friday, September 11, 2015 1:03 PM
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Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

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Congressional interest in the safety of the water is also very high, and this will be an important issue in deciding options for treating the water, in the weeks and months ahead.

Best Regards,

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Maybe. My contact at Legal let me know the other day that he's unusually busy with other matters right now, so his review of DUAs might be delayed unless there was a specific reason for quicker action on his part.

If you are in need of a reasonably-quick turnaround—i.e., a week rather than a month or so—then please send me a paragraph explaining why. I'll pass that along with your DUA.

If you're not in a hurry, then I'm all set for now—I'll submit your DUA as is.

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Thursday, September 10, 2015 7:57 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
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Do you need anything else from me?

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Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:26 PM
To: Boes, Colin (DCH)
Subject: New DCH-1294, time-sensitive
Attachments: DCH-1294 Data Use and Non-Disclosure Agreement Edwards 091115.doc; Rapid Proposal Final.pdf

Colin,

Please see attached DUA and related proposal. I'm asking for a reasonably-quick turn-around on this request for de-identified data, if possible given your schedule. I've pasted Professor Edwards' comments below:

"Yes, I think there is clearly some urgency to the situation.

MDEQ has publicly stated that your blood lead records, are showing that there is no public health concern for residents in Flint.

The levels of lead in Flint water, that we are finding in our water sampling, are certainly in a range that can cause childhood lead poisoning.

Indeed, one child has already, likely been lead poisoned from exposure to high lead in water.

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Michigan Department of Health & Human Services
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Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.
Attachments: DCH-1294 Data Use and Non-Disclosure Agreement Edwards 091115.doc

Marc,

OK, I submitted your request including your proposal and the paragraph below. No guarantees on the timing, though.

I've attached a copy of the DCH-1294 here, because I made a few edits based on my previous experience with the review process.

Bob

From: Marc Edwards [mailto:edwardsm@vt.edu]
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From: Marc Edwards [<mailto:edwardsm@vt.edu>]
Sent: Tuesday, September 08, 2015 5:39 PM
To: 'Scott, Robert L. (DCH)'
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Here you go.

Best Regards,
Marc

From: Scott, Robert L. (DCH) [<mailto:ScottR9@michigan.gov>]
Sent: Tuesday, September 08, 2015 7:55 AM
To: Marc Edwards
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Yes, sorry for the delay; I'll get you a more complete answer later today.

From: Marc Edwards [<mailto:edwardsm@vt.edu>]
Sent: Monday, September 07, 2015 11:40 AM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: FW: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Robert,

Can you confirm that you received the e-mail below, with the request for blood lead data on Flint?

Marc

From: Marc Edwards [<mailto:edwardsm@vt.edu>]
Sent: Wednesday, September 2, 2015 8:36 PM
To: 'scottrob@michigan.gov' <scottrob@michigan.gov>
Subject: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Hi Robert,

I would like to repeat the study I did below, but updated for Flint Michigan, Genesee County Michigan, and Detroit. What I need is blood lead data from all Flint zip codes, Genesee County zip codes and Detroit zip codes from 2011 to present.

Please do not identify the records by name, but have an ID code for each individual that can be sorted, along with the date of the measurement, blood lead result, zip code in which the child resides, and child's birth date so I can determine the age of the subject.

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If it can be provided in a format that can be read into EXCEL, that would be best.

Let me know if you need a new signed data sharing agreement, or whether our agreement from 2006 is still ok.

Best Regards,
Marc Edwards

Date: Fri, 17 Nov 2006 15:41:55 -0500
To: "Robert L. Scott" <scottrob@michigan.gov>
From: Marc Edwards <edwardsm@vt.edu>
Subject: Proposal and signed data agreement

Robert,

Attached is my signed agreement. My proposal is to do a study of potential benefits resulting from a community intervention in Lansing, MI.

Specifically, last year Lansing distributed drinking water filters and sent out enhanced flushing instructions to mitigate levels of lead in drinking water in homes with lead pipes. I am trying to determine whether this intervention had any discernable benefit on blood lead levels in the population.

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- 2) The same data for Ingham County (which I assume includes Lansing). If it is possible to get all data from within Ingham County but excluding Lansing that would be ideal. But I could presumably delete the duplicate data between set 1 and set 2 by hand if necessary.
- 3) The same data for the city of Detroit MI.

The statistical comparison will examine 1) temporal changes in % elevated blood lead for Lansing before and after the intervention, and 2) cross comparisons in trends between Lansing (with intervention) and Detroit and Ingham County (without intervention).

This is a fairly straightforward test that I suspect will confirm that no significant change arose due to the intervention in Lansing, consistent with water as a minor contributor to blood lead in Lansing.

If you should have additional questions please e-mail me at this address or call me at 540 231-7236,

Regards,
Marc Edwards

At 03:14 PM 11/17/2006, Robert L. Scott wrote:

Thanks for the info. Please see attached. Just a reminder that a "proposal" is also required. It need not be particularly long or formal, but should indicate clearly the data requested, and what you intend to do with it.

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:57 PM
To: 'Marc Edwards'
Subject: FW: New DCH-1294, time-sensitive

Marc,

(I also left you a phone message.) Please see below regarding an IRB review application. I told Colin that, as far as I know, our IRB director is expected back on Monday.

Have you submitted an IRB review application to Virginia Tech's IRB? If so, has it been approved? If that's the case, you can submit an Abbreviated IRB review app to MDHHS. It's available at www.michigan.gov/IRB.

If you haven't and don't intend to, please send me yet another paragraph explaining why not. I'm not an expert on these matters, and I'm still a little fuzzy on when an IRB review is required.

There is far more scrutiny of all data requests now than in 2006. That's a good thing in the long run, but makes it harder to move quickly.

Bob

From: Boes, Colin (DCH)
Sent: Friday, September 11, 2015 1:33 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: New DCH-1294, time-sensitive

Robert, thank you for letting me know about the time-sensitivity. I will do my best to get this turned around as soon as I can. Since this involves research you may wish to send it the IRB as well and let them know about the urgency. How soon do you think they were hoping to get it back? A few weeks? Shorter? I ask because our IRB director Ian is out of the office until at least next week (I cannot remember exactly how long he is out).

Colin Boes, JD
Privacy Specialist
Office of Legal Affairs & FOIA
Michigan Department of Health & Human Services
201 Townsend St.
Lansing, Michigan 48933
(517) 335-8558 – T (517) 241-1200 - F

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:26 PM
To: Boes, Colin (DCH)
Subject: New DCH-1294, time-sensitive

Colin,

Please see attached DUA and related proposal. I'm asking for a reasonably-quick turn-around on this request for de-identified data, if possible given your schedule. I've pasted Professor Edwards' comments below:

"Yes, I think there is clearly some urgency to the situation.
MDEQ has publicly stated that your blood lead records, are showing that there is no public health concern for residents in Flint.
The levels of lead in Flint water, that we are finding in our water sampling, are certainly in a range that can cause childhood lead poisoning.
Indeed, one child has already, likely been lead poisoned from exposure to high lead in water.
I think the fact that you already have other teams working on these records, indicates a high level of interest, and urgency.
Congressional interest in the safety of the water is also very high, and this will be an important issue in deciding options for treating the water, in the weeks and months ahead."

Thanks,
Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 2:53 PM
To: Priem, Wesley F. (DCH)
Subject: RE: Flint water study

Prof. Marc Edwards, Virginia Tech

From: Priem, Wesley F. (DCH)
Sent: Friday, September 11, 2015 2:34 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Flint water study

I know when I share this with my Division Director Linda Dykema she will also want to know who sent the request in to you. She has been involved in this issue.

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 2:08 PM
To: Priem, Wesley F. (DCH); Peeler, Nancy (DCH); Lishinski, Karen (DCH)
Subject: RE: Flint water study

Yes, it looks that way, but that's how I received it.

From: Priem, Wesley F. (DCH)
Sent: Friday, September 11, 2015 1:57 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>; Peeler, Nancy (DCH) <PeelerN@michigan.gov>; Lishinski, Karen (DCH) <LishinskiK@michigan.gov>
Subject: RE: Flint water study

Bob:

Was this all that was sent to you, looks like the cover page is missing?

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:09 PM
To: Peeler, Nancy (DCH); Lishinski, Karen (DCH); Priem, Wesley F. (DCH)
Subject: Flint water study

Nancy, Karen and Wes,

I'm passing this along as follow-up to our previous attention to the Flint water changeover situation. The attached was submitted to me along with a request for de-identified data, which should be no problem.

When you have a few minutes you might want to take a look at it. Sounds like there might be more to this than what we learned previously. Yikes!

Robert L. Scott
Childhood Lead Poisoning Prevention Program

Michigan Department of Health & Human Services

(517) 335-8178

fax (517) 335-8509

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Tuesday, September 15, 2015 9:18 AM
To: 'Marc Edwards'
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Marc,

Turns out you should submit an IRB review application to MDHHS. The application is available at www.michigan.gov/irb. It should be submitted to me, and then I'll add my info as "responsible employee" and submit it to the IRB board.

Bob

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Friday, September 11, 2015 1:03 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

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Sent: Friday, September 11, 2015 12:58 PM
To: Marc Edwards
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Maybe. My contact at Legal let me know the other day that he's unusually busy with other matters right now, so his review of DUAs might be delayed unless there was a specific reason for quicker action on his part.

If you are in need of a reasonably-quick turnaround—i.e., a week rather than a month or so—then please send me a paragraph explaining why. I'll pass that along with your DUA.

If you're not in a hurry, then I'm all set for now—I'll submit your DUA as is.

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Thursday, September 10, 2015 7:57 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

Do you need anything else from me?

Marc

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Tuesday, September 08, 2015 5:39 PM
To: 'Scott, Robert L. (DCH)'
Subject: RE: Repeat of 2006 study request, but for Flint and Genesee County and Detroit zip codes, from January 1 2011 to present.

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Specifically, last year Lansing distributed drinking water filters and sent out enhanced flushing instructions to mitigate levels of lead in drinking water in homes with lead pipes. I am trying to determine whether this intervention had any discernable benefit on blood lead levels in the population.

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At 03:14 PM 11/17/2006, Robert L. Scott wrote:

Thanks for the info. Please see attached. Just a reminder that a "proposal" is also required. It need not be particularly long or formal, but should indicate clearly the data requested, and what you intend to do with it.

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Tuesday, September 15, 2015 9:21 AM
To: 'Marc Edwards'
Subject: FW: New DCH-1294, time-sensitive

Marc,

Please see Colin's (Legal Affairs) comments below. I apologize for not passing it along yesterday—the day got away from me. I clearly have a lot to learn—I made changes to your document thinking it was a slam-dunk as de-identified, but was wrong, as indicated below.

Please make changes to your DCH-1294 as directed by Colin's comments, and re-submit to me, still no signature.

Thanks,
Bob

From: Boes, Colin (DCH)
Sent: Friday, September 11, 2015 2:08 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Cc: Horste, Ian (DCH) <Horstel@michigan.gov>
Subject: RE: New DCH-1294, time-sensitive

Robert,

Here are my comments regarding this DUA. Please feel free to give me a call if you have any questions. As I indicate below, we also need to see about whether our IRB needs to be involved.

1. I want to know more about the study that is being recreated in item 1. The attached protocol seems to discuss more about the study of the water samples, not the blood lead data. Saying that the researcher wants to verify the claim of MDEQ is not sufficient. It does not have to be a great deal longer, but it should explain what the intended use of the blood lead data is.

It is also important to know exactly how it will be used for research in order to justify the release not just under HIPAA, but also under R 325.9086 pertaining to the confidentiality of blood lead test reports. It must be for the "If necessary for the purpose of research designed to develop or contribute to generalizable knowledge, with documented approval by the department's institutional review board." R 325.9086(2)(e). I am not sure how Ian would handle this, given the language in the rule that seems to require IRB approval.

2. Tying in with 1. above, telling us that the analysis will be similar to some other study is insufficient. This section should tell us how the data will be used and disclosed, how many people (research team) might have access, what formats it might be used in and other similar information. The attached research protocol, as noted above, does not get into sufficient detail regarding exactly how our blood lead data will be used and how its use will be restricted.

I also need to know more about how the data will be secured on their end, how it will be handled, by who, and what will be done with it when it is no longer needed for their study.

3. The researcher indicates this data will be deidentified, but then goes on to ask for a number of identifiers that make the data identifiable, including county, city, and birth date of the child. In order for data to be deidentified (short of the statistical analysis method which would have to be documented and shown to us), it must not contain any geographic subdivision smaller than state. 45 CFR 164.414(b)(2)(i)(B). Additionally, all elements of dates related to the individual must not be included, which includes birth date. 45 CFR 164.414(b)(2)(i)(C). Therefore, the researcher must follow protocols for identifiable data, which may include requesting a waiver of informed consent from the IRB.

The researcher could possibly obtain the data requested as a limited data set without a waiver I believe (though we still would want to run it by the IRB). If this is the case, item 3.b. should be changed to "Limited Data Set."

Colin Boes, JD
Privacy Specialist
Office of Legal Affairs & FOIA
Michigan Department of Health & Human Services
201 Townsend St.
Lansing, Michigan 48933
(517) 335-8558 – T (517) 241-1200 - F

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:44 PM
To: Boes, Colin (DCH)
Subject: RE: New DCH-1294, time-sensitive

Thanks. I was told by a colleague of mine that Ian is expected back on Monday (I hope she was right).

I think the researcher is hoping for a turn-around with a week or so, but I'm sure he knows he can't make (and hasn't made) demands. I'll check with him about an IRB.

From: Boes, Colin (DCH)
Sent: Friday, September 11, 2015 1:33 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: New DCH-1294, time-sensitive

Robert, thank you for letting me know about the time-sensitivity. I will do my best to get this turned around as soon as I can. Since this involves research you may wish to send it the IRB as well and let them know about the urgency. How soon do you think they were hoping to get it back? A few weeks? Shorter? I ask because our IRB director Ian is out of the office until at least next week (I cannot remember exactly how long he is out).

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Thanks,
Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Wednesday, September 16, 2015 10:48 AM
To: Lawrence Reynolds; Mona Hanna-Attisha; Laura Caravallah; Dr. Lawrence Reynolds, M.D.
Cc: Peeler, Nancy (DCH); Lishinski, Karen (DCH); Emily Houk (emily@r2pconsultants.com); Scott, Robert L. (DCH)
Subject: RE: Lead level data

Dr. Reynolds,

I'll be happy to slice up the data in that way, including the most recent months available. I'll be out of the office for the next few days, but will work on it when I get back.

It's my understanding that the State will develop a fact sheet as well as a tip sheet on lead-safe water use for parents. I'm not sure how they'll be made public.

Thanks,
Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Lawrence Reynolds [mailto:frey52@gmail.com]
Sent: Wednesday, September 16, 2015 10:31 AM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>; Mona Hanna-Attisha <MHanna1@hurleymc.com>; Laura Caravallah <lcarav1@yahoo.com>; Dr. Lawrence Reynolds, M.D. <reynolds@mottchc.org>
Subject: Lead level data

Good morning Mr. Scott .

Thank you for your timely response.I have reviewed the graphs with our GCHD and Dr. Mona Hanna-Attisha of Hurley.Is it possible to stratify the data by age -under 15 months, 16 months to under 6 years of age , over 6 years.Also can we get the most recent data for 2015.

At this point we will work with our patients to educate them.

Breast feeding is first choice .

I understand different filters do different things for lead , and not all get lead clumps from leaching pipes so we will not emphasize them.

We will try to get WIC to cover bottled water and encourage using water from outside the city system Our goal is to give the most consistent correct information.

Are there any plans for public service announcements from the state ?

I am asking you to cc my reynolds@mottchc.org email along with lrey52@gmail so I can access from anywhere.

--
Lawrence Reynolds

Scott, Robert L. (DHHS)

From: Mona Hanna-Attisha <MHanna1@hurleymc.com>
Sent: Wednesday, September 16, 2015 3:10 PM
To: Scott, Robert L. (DCH)
Cc: Lawrence Reynolds
Subject: FW: IRBNet Board Action
Attachments: IRBNetDocument (33).pdf; Study Proposal IRB BLL MHA.pdf

Bob, I just received IRB approval to look at the City of Flint blood lead levels. I would love to get the raw data if that is possible. Attached is my study proposal and the IRB approval.

Specific fields that we are looking for include:

MCIR ID or some sort of identifier to ensure first time lead level only Zip code Date of Birth Date of Blood lead level Lead level

Would greatly appreciate your assistance! Thanks!

Mona Hanna-Attisha MD MPH FAAP
Program Director Pediatric Residency
Hurley Children's Hospital at Hurley Medical Center Michigan State University College of Human Medicine Department of Pediatrics and Human Development Mhanna1@hurleymc.com

-----Original Message-----

From: Nicolas Lecea [mailto:no-reply@irbnet.org]
Sent: Wednesday, September 16, 2015 2:09 PM
To: Jenny LaChance; Mona Hanna-Attisha
Subject: IRBNet Board Action

Please note that Hurley Medical Center Institutional Review Board has taken the following action on IRBNet:

Project Title: [807433-1] Analysis of Pediatric Blood Lead Levels Principal Investigator: Mona Hanna-Attisha, MD MPH

Submission Type: New Project
Date Submitted: September 15, 2015

Action: APPROVED
Effective Date: September 16, 2015
Review Type: Expedited Review

Should you have any questions you may contact Nicolas Lecea at nlecea1@hurleymc.com.

Thank you,
The IRBNet Support Team

Scott, Robert L. (DHHS)

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 4:14 PM
To: Scott, Robert L. (DCH); Lishinski, Karen (DCH); Emily Houk R2P
(emily@r2pconsultants.com)
Cc: Smith, Jennifer (DCH)
Subject: FW: MI lead POC

FYI - Jen, this is part of why we are working on talking points. Because of this, I imagine we'll want to include points about what our program offers/can do.

-----Original Message-----

From: Credle, Kimball (CDC/ONDIEH/NCEH) [mailto:kfc2@cdc.gov]
Sent: Wednesday, September 16, 2015 3:39 PM
To: Merkle, Sarah (CDC/ONDIEH/NCEH)
Cc: Peeler, Nancy (DCH)
Subject: RE: MI lead POC

Sure!

The POC there is Nancy Peeler. Her phone number and email address is (517)335-9230 - peelern@michigan.gov

I spoke with her last week about this issue and she assured me that they were complying with local inquiries and providing the necessary support.

Kimball F. Credle, MPH
Public Health Advisor
Healthy Homes and Lead Poisoning Prevention Program CDC, NCEH, EEHS
4770 Buford Highway (MS - F58)
Atlanta, GA. 30341
(770)488-3643 Office
(770)488-3635 Fax
 PPI Cell

kc

-----Original Message-----

From: Merkle, Sarah (CDC/ONDIEH/NCEH)
Sent: Wednesday, September 16, 2015 12:09 PM
To: Credle, Kimball (CDC/ONDIEH/NCEH) <kfc2@cdc.gov>
Cc: Brown, Mary Jean (CDC/ONDIEH/NCEH) <mjb5@cdc.gov>
Subject: MI lead POC

Hi Kimball,

I've been working with OPPE and Mary Jean on a congressional inquiry about lead in water in Flint, MI.

Could you please send me the MI lead program POC?

Thanks!

Sarah

Sarah Merkle, MPH

Associate Director for Policy || Division of Emergency and Environmental Health Services (DEEHS) || CDC - National Center for Environmental Health

Phone: 770-488-0541 || Email: smerkle@cdc.gov || Cell: [REDACTED] PPI [REDACTED]

Scott, Robert L. (DHHS)

From: Smith, Jennifer (DCH)
Sent: Wednesday, September 16, 2015 4:19 PM
To: Peeler, Nancy (DCH); Scott, Robert L. (DCH); Lishinski, Karen (DCH); Emily Houk R2P (emily@r2pconsultants.com)
Cc: Lasher, Geralyn (DCH); Minicuci, Angela (DCH); Hertel, Elizabeth (DCH)
Subject: RE: MI lead POC

Thanks Nancy. I'm looping in Geralyn, Angela, and Elizabeth as a heads up about the congressional hearing.

Do you know when the hearing is taking place? Is DEQ involved?

Thank you,
Jennifer

-----Original Message-----

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 4:14 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>; Lishinski, Karen (DCH) <LishinskiK@michigan.gov>; Emily Houk R2P (emily@r2pconsultants.com) <emily@r2pconsultants.com>
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4770 Buford Highway (MS - F58)
Atlanta, GA. 30341
(770)488-3643 Office
(770)488-3635 Fax

PPI

Cell

kc

-----Original Message-----

From: Merkle, Sarah (CDC/ONDIEH/NCEH)
Sent: Wednesday, September 16, 2015 12:09 PM
To: Credle, Kimball (CDC/ONDIEH/NCEH) <kfc2@cdc.gov>
Cc: Brown, Mary Jean (CDC/ONDIEH/NCEH) <mjb5@cdc.gov>
Subject: MI lead POC

Hi Kimball,

I've been working with OPPE and Mary Jean on a congressional inquiry about lead in water in Flint, MI.

Could you please send me the MI lead program POC?

Thanks!

Sarah

Sarah Merkle, MPH

Associate Director for Policy || Division of Emergency and Environmental Health Services (DEEHS) || CDC - National Center for Environmental Health

Phone: 770-488-0541 || Email: smerkle@cdc.gov || Cell: PPI

Scott, Robert L. (DHHS)

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 4:21 PM
To: Smith, Jennifer (DCH); Scott, Robert L. (DCH); Lishinski, Karen (DCH); Emily Houk R2P (emily@r2pconsultants.com)
Cc: Lasher, Geralyn (DCH); Minicuci, Angela (DCH); Hertel, Elizabeth (DCH)
Subject: RE: MI lead POC

I don't have any details other than what I forwarded, sorry. The Congressional piece is new information for me. If I hear from the CDC person, I will pass along whatever I learn from him/her.

-----Original Message-----

From: Smith, Jennifer (DCH)
Sent: Wednesday, September 16, 2015 4:19 PM
To: Peeler, Nancy (DCH); Scott, Robert L. (DCH); Lishinski, Karen (DCH); Emily Houk R2P (emily@r2pconsultants.com)
Cc: Lasher, Geralyn (DCH); Minicuci, Angela (DCH); Hertel, Elizabeth (DCH)
Subject: RE: MI lead POC

Thanks Nancy. I'm looping in Geralyn, Angela, and Elizabeth as a heads up about the congressional hearing.

Do you know when the hearing is taking place? Is DEQ involved?

Thank you,
Jennifer

-----Original Message-----

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 4:14 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>; Lishinski, Karen (DCH) <LishinskiK@michigan.gov>; Emily Houk R2P (emily@r2pconsultants.com) <emily@r2pconsultants.com>
Cc: Smith, Jennifer (DCH) <smithj32@michigan.gov>
Subject: FW: MI lead POC

FYI - Jen, this is part of why we are working on talking points. Because of this, I imagine we'll want to include points about what our program offers/can do.

-----Original Message-----

From: Credle, Kimball (CDC/ONDIEH/NCEH) [mailto:kfc2@cdc.gov]
Sent: Wednesday, September 16, 2015 3:39 PM
To: Merkle, Sarah (CDC/ONDIEH/NCEH)
Cc: Peeler, Nancy (DCH)
Subject: RE: MI lead POC

Sure!

The POC there is Nancy Peeler. Her phone number and email address is (517)335-9230 - peelern@michigan.gov

I spoke with her last week about this issue and she assured me that they were complying with local inquiries and providing the necessary support.

Kimball F. Credle, MPH
Public Health Advisor
Healthy Homes and Lead Poisoning Prevention Program CDC, NCEH, EEHS
4770 Buford Highway (MS - F58)
Atlanta, GA. 30341
(770)488-3643 Office
(770)488-3635 Fax

kc

-----Original Message-----

From: Merkle, Sarah (CDC/ONDIEH/NCEH)
Sent: Wednesday, September 16, 2015 12:09 PM
To: Credle, Kimball (CDC/ONDIEH/NCEH) <kfc2@cdc.gov>
Cc: Brown, Mary Jean (CDC/ONDIEH/NCEH) <mjb5@cdc.gov>
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Thanks!

Sarah

Sarah Merkle, MPH

Associate Director for Policy || Division of Emergency and Environmental Health Services (DEEHS) || CDC - National Center for Environmental Health

Phone: 770-488-0541 || Email: smerkle@cdc.gov || Cell:

12 October 2015
DRAFT MDHHS Flint Water Action Plan

Last Updated: 11:30 AM on October 12, 2015			
Action	Local Lead	MDHHS Lead	Tasks
Filter/Water Distribution	United Way (current) A local lead needs to be identified to head distribution operations (possibly with the LHD)*	E. Hertel (filters) It is possible that Richard Thelen may be the new MDHHS lead; requires further discussion*	Eden to talk to Jamie: <ul style="list-style-type: none">- Coordination- Tracking filters- Ordering filter replacements- Identify a local lead
Blood Testing (venous preferable; confirm with Linda Dykema or do we want capillary testing?)	Needs to be identified* Possible partners: <ul style="list-style-type: none">- Hurley- Great Flint Health Coalition- MIHP- LHD- Schools	Linda Dykema	<ul style="list-style-type: none">- Identification of all current positives (retest)- Test all (capillary v. venous testing?*)<ul style="list-style-type: none">o Students 0-16o Priorities:<ul style="list-style-type: none">▪ 3 schools▪ 2 zip codes▪ ages 0-15- Partner with schools- Partner with Great Flint Health Coalition- Partner with Hurley- Partner with LHD- Partner with MIHP (Medicaid)- Confirm that the state lab has capacity to handle increase in tests
Elevated Blood Level Investigations(all > 5 mg/dl)	Needs to be identified*	Linda Dykema	
Communications	Needs to be identified*	Geralyn L/Tim B	<ul style="list-style-type: none">- Develop plan- Provide provider education- Provide public education- Provide risk education- Send resources to Flint

Scott, Robert L. (DHHS)

From: Marc Edwards <edwardsm@vt.edu>
Sent: Monday, September 21, 2015 1:20 PM
To: Scott, Robert L. (DCH)
Subject: RE: New DCH-1294, time-sensitive

I am not sure how we can proceed. The Age in months would be fine.

But is it true that providing zip code level analysis, if you combine 48503 and 48504 into a "high risk" Flint area (50000+ residents), and the rest into a "low risk" Flint area, is by definition identified?

In that case, do I need to do an IRB, with my institution, to obtain data from you identified at the zip code level, and then get approval for that? Data would only be handled by me on my computer which is password protected.

If I get our IRB approval for my study with only zip code identified, are you then allowed to share that data (with zip code identified) with me?

Ultimately, zip code data will be combined into EBL% within that zip code, and there is no intention to look at individuals except by age in months.

I am not sure how to proceed.

Marc

From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Tuesday, September 15, 2015 5:10 PM
To: Marc Edwards
Subject: RE: New DCH-1294, time-sensitive

I can certainly provide age in years instead of date of birth, although either one would be acceptable according to this link I found:

http://www.hopkinsmedicine.org/institutional_review_board/hipaa_research/limited_data_set.html

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Tuesday, September 15, 2015 4:58 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: New DCH-1294, time-sensitive

Can you tell me how I can do a limited dataset? Can I just have the age in years, for example?

Thanks so much!

Marc

From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Tuesday, September 15, 2015 9:21 AM
To: Marc Edwards
Subject: FW: New DCH-1294, time-sensitive

Marc,

Please see Colin's (Legal Affairs) comments below. I apologize for not passing it along yesterday—the day got away from me. I clearly have a lot to learn—I made changes to your document thinking it was a slam-dunk as de-identified, but was wrong, as indicated below.

Please make changes to your DCH-1294 as directed by Colin's comments, and re-submit to me, still no signature.

Thanks,
Bob

From: Boes, Colin (DCH)
Sent: Friday, September 11, 2015 2:08 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Cc: Horste, Ian (DCH) <Horstel@michigan.gov>
Subject: RE: New DCH-1294, time-sensitive

Robert,

Here are my comments regarding this DUA. Please feel free to give me a call if you have any questions. As I indicate below, we also need to see about whether our IRB needs to be involved.

1. I want to know more about the study that is being recreated in item 1. The attached protocol seems to discuss more about the study of the water samples, not the blood lead data. Saying that the researcher wants to verify the claim of MDEQ is not sufficient. It does not have to be a great deal longer, but it should explain what the intended use of the blood lead data is.

It is also important to know exactly how it will be used for research in order to justify the release not just under HIPAA, but also under R 325.9086 pertaining to the confidentiality of blood lead test reports. It must be for the "If necessary for the purpose of research designed to develop or contribute to generalizable knowledge, with documented approval by the department's institutional review board." R 325.9086(2)(e). I am not sure how Ian would handle this, given the language in the rule that seems to require IRB approval.

2. Tying in with 1. above, telling us that the analysis will be similar to some other study is insufficient. This section should tell us how the data will be used and disclosed, how many people (research team) might have access, what formats it might be used in and other similar information. The attached research protocol, as noted above, does not get into sufficient detail regarding exactly how our blood lead data will be used and how its use will be restricted.

I also need to know more about how the data will be secured on their end, how it will be handled, by who, and what will be done with it when it is no longer needed for their study.

3. The researcher indicates this data will be deidentified, but then goes on to ask for a number of identifiers that make the data identifiable, including county, city, and birth date of the child. In order for data to be deidentified (short of the statistical analysis method which would have to be documented and shown to us), it must not contain any geographic subdivision smaller than state. 45 CFR 164.414(b)(2)(i)(B).

Additionally, all elements of dates related to the individual must not be included, which includes birth date. 45 CFR 164.414(b)(2)(i)(C). Therefore, the researcher must follow protocols for identifiable data, which may include requesting a waiver of informed consent from the IRB.

The researcher could possibly obtain the data requested as a limited data set without a waiver I believe (though we still would want to run it by the IRB). If this is the case, item 3.b. should be changed to "Limited Data Set."

Colin Boes, JD
Privacy Specialist
Office of Legal Affairs & FOIA
Michigan Department of Health & Human Services
201 Townsend St.
Lansing, Michigan 48933
(517) 335-8558 – T (517) 241-1200 - F

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:44 PM
To: Boes, Colin (DCH)
Subject: RE: New DCH-1294, time-sensitive

Thanks. I was told by a colleague of mine that Ian is expected back on Monday (I hope she was right).

I think the researcher is hoping for a turn-around with a week or so, but I'm sure he knows he can't make (and hasn't made) demands. I'll check with him about an IRB.

From: Boes, Colin (DCH)
Sent: Friday, September 11, 2015 1:33 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: New DCH-1294, time-sensitive

Robert, thank you for letting me know about the time-sensitivity. I will do my best to get this turned around as soon as I can. Since this involves research you may wish to send it the IRB as well and let them know about the urgency. How soon do you think they were hoping to get it back? A few weeks? Shorter? I ask because our IRB director Ian is out of the office until at least next week (I cannot remember exactly how long he is out).

Colin Boes, JD
Privacy Specialist
Office of Legal Affairs & FOIA
Michigan Department of Health & Human Services
201 Townsend St.
Lansing, Michigan 48933
(517) 335-8558 – T (517) 241-1200 - F

From: Scott, Robert L. (DCH)
Sent: Friday, September 11, 2015 1:26 PM
To: Boes, Colin (DCH)
Subject: New DCH-1294, time-sensitive

Colin,

Please see attached DUA and related proposal. I'm asking for a reasonably-quick turn-around on this request for de-identified data, if possible given your schedule. I've pasted Professor Edwards' comments below:

"Yes, I think there is clearly some urgency to the situation.

MDEQ has publicly stated that your blood lead records, are showing that there is no public health concern for residents in Flint.

The levels of lead in Flint water, that we are finding in our water sampling, are certainly in a range that can cause childhood lead poisoning.

Indeed, one child has already, likely been lead poisoned from exposure to high lead in water.

I think the fact that you already have other teams working on these records, indicates a high level of interest, and urgency.

Congressional interest in the safety of the water is also very high, and this will be an important issue in deciding options for treating the water, in the weeks and months ahead."

Thanks,

Bob

Robert L. Scott

Childhood Lead Poisoning Prevention Program

Michigan Department of Health & Human Services

(517) 335-8178

fax (517) 335-8509

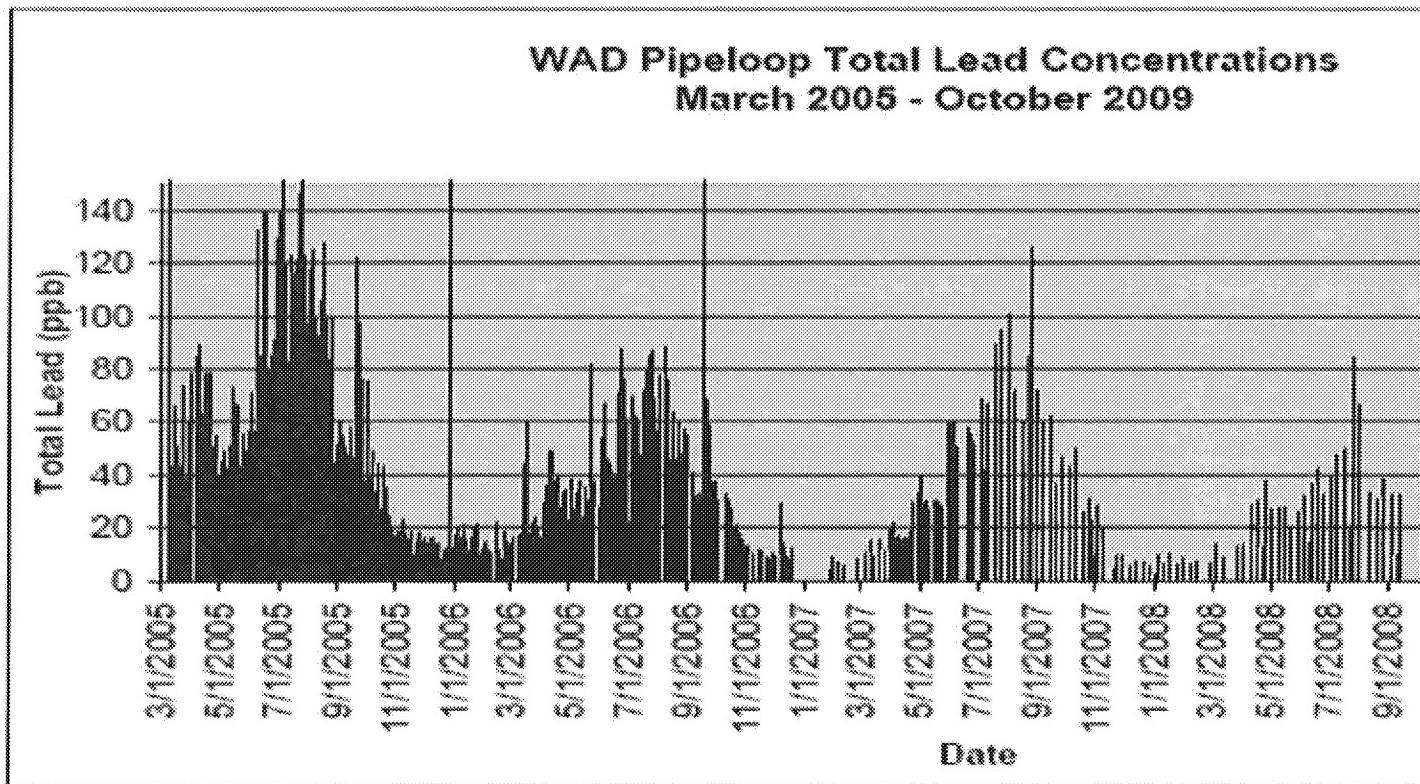
Scott, Robert L. (DHHS)

From: Marc Edwards <edwardsm@vt.edu>
Sent: Friday, September 25, 2015 10:08 PM
To: Scott, Robert L. (DCH)
Subject: lead in water seasonal

These results are from lead pipe loops run at the Washington Aqueduct in Triplicate...you get the idea.
The correlation with temperature in that system was something like R² = 0.7 or so.

There are also peer reviewed papers showing that blood lead in summer peaks due to elevated water lead.
Water lead does not have to be constant. This is well known.

Marc



Scott, Robert L. (DHHS)

From: Marc Edwards <edwardsm@vt.edu>
Sent: Friday, September 25, 2015 1:12 PM
To: 'Mona Hanna-Attisha'; Scott, Robert L. (DCH); 'Jenny LaChance'
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Mona,

When you get the data let me know. Since you are involved and have apparently requested the data already (independently), I will not be bothering Robert further.

However, I will be speaking out, about the unethical behavior of the state in not sharing the data to date, and their abusing of power to discredit the work you have done.

The second they give you the data I will stop speaking out.

Robert, I apologize to you because I know you did not have anything to do with it, but what is happening here is just wrong.

Best Regards,

Marc

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Friday, September 25, 2015 1:00 PM
To: 'Mona Hanna-Attisha'; 'Scott, Robert L. (DCH)'; 'Jenny LaChance'
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

I understand that, and I appreciate what you are doing.

I also hope you can understand my frustration, at seeing this data given to reporters in an relatively unprocessed and unscientific format, used to support a claim that there is not a problem with lead in water in Flint.

And worst of all, seeing it used to "refute" the sound science that Mona did with her in-house data. I know you did not have anything to do with that, but I strongly feel that what is happening is unethical.

I hope you send my message to whoever is abusing the data (and the public trust, and the science method) in this way.

I will be calling the state out on this abuse, as long as it continues. I stand by my statements this is third rate and unscientific science that is being circulated by the state, and your department should have expedited Mona's requests to get access to the data. I am probably going to step aside and let her handle it from here, and as soon as you get her the data I will stop speaking out. She has proven herself to be a capable researcher.

You should also tell the team that is analyzing the data, that lead in water often peaks in the summer months, and declines in the winter months. It is clear from their one pager that they do not know the first thing about lead in water.

Marc

From: Mona Hanna-Attisha [mailto:MHanna1@hurleymc.com]
Sent: Friday, September 25, 2015 12:51 PM
To: 'Scott, Robert L. (DCH)'; Marc Edwards; Jenny LaChance
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Thanks Bob. We greatly appreciate all your assistance and your hard work!

It's interesting to note that the number of children tested in July and August of 2015 is so small as compared to the same months in previous years? Do you think those numbers capture all the tests that were done – is there a lag time in reporting to your system?

Thanks! Mona

From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Friday, September 25, 2015 12:44 PM
To: Marc Edwards
Cc: Mona Hanna-Attisha; Peeler, Nancy (DCH); Minicuci, Angela (DCH)
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Marc,

As you well know, the data you and Dr. Hanna-Attisha have requested are derived from personal health data, which of course is confidential. There are state and federal laws governing what can be shared, and how, with researchers or the public.

I worked with you earlier this month to get data to you relatively quickly, but we did not manage to complete the process before I went on annual leave for several days. I neglected to inform you that I'd be away. I returned on Wednesday and corresponded that day with Dr. Hanna-Attisha, providing her with the forms she'll need for her request.

Regarding your email from Monday, I think you'll be able to get approval for data with zip code identified. I'll edit your data use agreement accordingly, will adjust it to say "limited data set" instead of "de-identified," and will re-submit it to our Legal office. You will need to submit an MDHHS IRB review application (attached) because this is considered research. You should also submit a "HIPAA Waiver Request" (attached). (I wasn't aware of the Waiver Request when we talked earlier this month.) Send those documents to me, and I'll pass them on to our IRB contact. I don't know whether you'll need to go through an IRB review with your institution.

In short, both your request and Dr. Hanna-Attisha's are in process in accordance with departmental policies.

I've attached a PDF that includes the numbers behind the graphs you referred to, and I'm CC'ing Dr. Hanna-Attisha so that she has it as well.

Please keep in mind that I work for a very small program responsible for processing several thousand blood lead results every week--in order to get them out to the professionals working directly with children and families, which is the primary purpose and highest priority of our program.

Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Marc Edwards [<mailto:edwardsm@vt.edu>]
Sent: Thursday, September 24, 2015 8:14 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Dear Robert,

I just spoke to this young researcher at Hurley, and apparently, she has been unable to get access to the state blood lead records.

I have to say, it is very disturbing that the state keeps issuing these blood lead reports and statements in their press releases, and refuses to share the data backing them up with outside researchers.

Even worse, state reps are running around claiming that these reports are proof that Flint water is safe to drink.

Can you tell me why it is so difficult to get this data, and why your agency is raising so many obstacles to sharing it with everyone who asks? I note that I have been asking to see your data since MDEQ first sent it to reporters back in August, and I count 10 e-mails that I sent responding to all your questions. As of yet, you have given me nothing in response. Yet you have been sending reporters one report after another. It seems your agency is more interested in public relations than sound science.

In the meantime, can I at least be given the numbers of EBL cases and number of tests each month, that are the basis for the latest graph your agency is sending to the press...or is that top secret as well?

Marc

From: Scott, Robert L. (DCH) [<mailto:ScottR9@michigan.gov>]
Sent: Monday, September 21, 2015 1:21 PM
To: Marc Edwards
Subject: Automatic reply: New DCH-1294, time-sensitive

I'll be out of the office until Wednesday, Sept 23. I'll respond to your message when I return.

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Friday, September 25, 2015 9:35 AM
To: Minicuci, Angela (DCH); Eisner, Jennifer (DCH)
Cc: Peeler, Nancy (DCH)
Subject: question on email response regarding Flint blood lead data
Attachments: Flint Testing and EBLLs_updated 092315_with notes.pdf; HIPAA Waiver Request Template.doc; DCH-1277 IRB Initial Review Application.doc

Angela or Jennifer,

Please see Dr. Edwards email below, and my draft response to him. I'm not very happy with him right now, but tried to respond appropriately. Given the sensitive nature of the situation, I'm checking with you first. Nancy is on annual leave, but I've CC'd her here.

Is it OK to send this? Please feel free to make changes as appropriate. I'm also asking if it's OK now to share the attached PDF with Dr. Edwards and Dr. Hanna-Attisha.

Thanks,
Bob

Marc,

As you well know, the data you and Dr. Hanna-Attisha are requesting are derived from personal health data, which of course is confidential. There are state and federal laws governing what can be shared, and how, with researchers or the public. In addition, my Department has policies on how to determine what can be shared.

I worked with you earlier this month to get data to you relatively quickly, but did not manage to complete the process before I went on annual leave for several days. I neglected to inform you that I'd be away, and I apologize for not informing you. Unfortunately we are a very small program, and there's no one else here to process your request—or Dr. Hanna-Attisha's.

Since I returned on Wednesday, my time has been largely taken up with my Department's response to the current situation in Flint. I did manage to correspond to Dr. Hanna-Attisha, and provided her with the forms she'll need for her request. I hope to submit her request to our Legal office and to our IRB contact today.

Sorry I haven't responded to your email from Monday—as I mentioned above, I was away, and then have been juggling many tasks since I returned. I think you'll be able to get approval for data with zip code identified. I'll edit your data use agreement accordingly, and will adjust it to say "limited data set" instead of "de-identified." I'll re-submit your DUA to Legal today. You will need to submit an MDHHS IRB review application (attached) because this is considered research. You should also submit a "HIPAA Waiver Request" (attached). (I wasn't aware of that when we talked earlier this month.) I don't know whether you'll need to go through an IRB review with your institution.

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Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Thursday, September 24, 2015 8:14 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

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Sent: Monday, September 21, 2015 1:21 PM
To: Marc Edwards
Subject: Automatic reply: New DCH-1294, time-sensitive

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Scott, Robert L. (DHHS)

From: Peeler, Nancy (DCH)
Sent: Friday, September 25, 2015 9:53 AM
To: Scott, Robert L. (DCH)
Cc: Minicuci, Angela (DCH); Eisner, Jennifer (DCH)
Subject: Re: question on email response regarding Flint blood lead data

Bob, I appreciate your efforts to work on this email. I think we can apologize less, and just concisely lay out the steps that have been taken, and need to be taken (which you have). Angela and Jennifer, if you have input that can help shape this, I also would appreciate that help.

Nancy

Sent from my iPad

On Sep 25, 2015, at 9:34 AM, Scott, Robert L. (DCH) <ScottR9@michigan.gov> wrote:

Angela or Jennifer,

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Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Marc Edwards [mailto:edwardsma@vt.edu]
Sent: Thursday, September 24, 2015 8:14 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

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In the meantime, can I at least be given the numbers of EBL cases and number of tests each month, that are the basis for the latest graph your agency is sending to the press...or is that top secret as well?

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From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Monday, September 21, 2015 1:21 PM
To: Marc Edwards
Subject: Automatic reply: New DCH-1294, time-sensitive

I'll be out of the office until Wednesday, Sept 23. I'll respond to your message when I return.

<Flint Testing and EBLLs_updated 092315_with notes.pdf>

<HIPAA Waiver Request Template.doc>

<DCH-1277 IRB Initial Review Application.doc>

Scott, Robert L. (DHHS)

From: Peeler, Nancy (DCH)
Sent: Friday, September 25, 2015 10:37 AM
To: Scott, Robert L. (DCH)
Subject: Re: question on email response regarding Flint blood lead data

I'm sitting in Zoe's quantum mechanics class, no clue what these differential equations are telling me, but I am stewing a bit about this situation. I want to say that you always do a great job, and are responsive to all data requests, and advocate to help researchers get whatever paperwork completed and turned in. That's why this feels so inappropriate to me - this isn't your fault, thus my earlier comment about apologizing less. And having said that, it probably wasn't a really helpful comment toward revising the response.

The email you received could be read as an intent to escalate and spin things, and I don't think you need to get caught up in that. A calm, fact-based response is very appropriate.

I think your first paragraph is good, but I would remove the last sentence, as I'm not sure what policies you are referencing beyond state and federal law -- and, I think the state and federal law carry enough weight that our departmental policies probably don't change much of anything about the process.

For paragraphs 2 and 3 I think I would just say state the facts, which is that both requests are in process in accordance with departmental policies - because they are. You really don't need to apologize for taking vacation, and I consider anybody's vacation time to be a normal part of doing business - none of us are expected to be at our desks every day, and there is no way to predict what might come up when we are planning to be away.

In your 4th paragraph, it looks like he is changing his data request? I appreciate your generosity in taking on responsibility to do his work for him (editing his paperwork) - your option, whether you want to do that, or request that he re-do it. I would outline the steps, clarify that you have confirmed the process which revealed the extra step, and let him know you'll watch for his response.

Finally, I might close with the piece about a small program, responsible for processing a high number of results every day or week (you sent me a number last week) in order to get them out to the professionals working directly with children and families, which IS the purpose and highest priority of our program.

I hope some of this is helpful and not too late - hope the rest of the day goes better. Thank you for all you do!

Sent from my iPad

On Sep 25, 2015, at 9:34 AM, Scott, Robert L. (DCH) <ScottR9@michigan.gov> wrote:

Angela or Jennifer,

Please see Dr. Edwards email below, and my draft response to him. I'm not very happy with him right now, but tried to respond appropriately. Given the sensitive nature of the situation, I'm checking with you first. Nancy is on annual leave, but I've CC'd her here.

Is it OK to send this? Please feel free to make changes as appropriate. I'm also asking if it's OK now to share the attached PDF with Dr. Edwards and Dr. Hanna-Attisha.

Thanks,
Bob

Marc,

As you well know, the data you and Dr. Hanna-

Attisha are requesting are derived from personal health data, which of course is confidential. There are state and federal laws governing what can be shared, and how, with researchers or the public. In addition, my Department has policies on how to determine what can be shared.

I worked with you earlier this month to get data to you relatively quickly, but did not manage to complete the process before I went on annual leave for several days. I neglected to inform you that I'd be away, and I apologize for not informing you. Unfortunately we are a very small program, and there's no one else here to process your request—or Dr. Hanna-Attisha's.

Since I returned on Wednesday, my time has been largely taken up with my Department's response to the current situation in Flint. I did manage to correspond to Dr. Hanna-Attisha, and provided her with the forms she'll need for her request. I hope to submit her request to our Legal office and to our IRB contact today.

Sorry I haven't responded to your email from Monday—as I mentioned above, I was away, and then have been juggling many tasks since I returned. I think you'll be able to get approval for data with zip code identified. I'll edit your data use agreement accordingly, and will adjust it to say "limited data set" instead of "de-identified." I'll re-submit your DUA to Legal today. You will need to submit an MDHHS IRB review application (attached) because this is considered research. You should also submit a "HIPAA Waiver Request" (attached). (I wasn't aware of that when we talked earlier this month.) I don't know whether you'll need to go through an IRB review with your institution.

I've also attached a PDF that includes the numbers behind the graphs you referred to, and I'm CC'ing Dr. Hanna-Attisha so that she has it as well.

Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Marc Edwards [mailto:edwards@vt.edu]
Sent: Thursday, September 24, 2015 8:14 PM

To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Dear Robert,

I just spoke to this young researcher at Hurley, and apparently, she has been unable to get access to the state blood lead records.

I have to say, it is very disturbing that the state keeps issuing these blood lead reports and statements in their press releases, and refuses to share the data backing them up with outside researchers.

Even worse, state reps are running around claiming that these reports are proof that Flint water is safe to drink.

Can you tell me why it is so difficult to get this data, and why your agency is raising so many obstacles to sharing it with everyone who asks? I note that I have been asking to see your data since MDEQ first sent it to reporters back in August, and I count 10 e-mails that I sent responding to all your questions. As of yet, you have given me nothing in response. Yet you have been sending reporters one report after another. It seems your agency is more interested in public relations than sound science.

In the meantime, can I at least be given the numbers of EBL cases and number of tests each month, that are the basis for the latest graph your agency is sending to the press...or is that top secret as well?

Marc

From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Monday, September 21, 2015 1:21 PM
To: Marc Edwards
Subject: Automatic reply: New DCH-1294, time-sensitive

I'll be out of the office until Wednesday, Sept 23. I'll respond to your message when I return.

<Flint Testing and EBLLs_updated 092315_with notes.pdf>

<HIPAA Waiver Request Template.doc>

<DCH-1277 IRB Initial Review Application.doc>

Scott, Robert L. (DHHS)

From: Scott, Robert L. (DCH)
Sent: Friday, September 25, 2015 1:02 PM
To: 'Mona Hanna-Attisha'; Marc Edwards; Jenny LaChance
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Mona,

There's generally a lag of about two weeks from the date of the test to its being fully processed in our system. A few results take longer, for a variety of reasons. 99% of all results through August should be reflected in those numbers. Not sure why the last few months were so low.

Thanks,
Bob

From: Mona Hanna-Attisha [mailto:Mhanna1@hurleymc.com]
Sent: Friday, September 25, 2015 12:51 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>; Marc Edwards <edwardsm@vt.edu>; Jenny LaChance <Jlachan1@hurleymc.com>
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Thanks Bob. We greatly appreciate all your assistance and your hard work!

It's interesting to note that the number of children tested in July and August of 2015 is so small as compared to the same months in previous years? Do you think those numbers capture all the tests that were done – is there a lag time in reporting to your system?

Thanks! Mona

From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Friday, September 25, 2015 12:44 PM
To: Marc Edwards
Cc: Mona Hanna-Attisha; Peeler, Nancy (DCH); Minicuci, Angela (DCH)
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Marc,

As you well know, the data you and Dr. Hanna-Attisha have requested are derived from personal health data, which of course is confidential. There are state and federal laws governing what can be shared, and how, with researchers or the public.

I worked with you earlier this month to get data to you relatively quickly, but we did not manage to complete the process before I went on annual leave for several days. I neglected to inform you that I'd be away. I returned on Wednesday and corresponded that day with Dr. Hanna-Attisha, providing her with the forms she'll need for her request.

Regarding your email from Monday, I think you'll be able to get approval for data with zip code identified. I'll edit your data use agreement accordingly, will adjust it to say "limited data set" instead of "de-identified," and will re-submit it to our Legal office. You will need to submit an MDHHS IRB review application (attached) because this is considered

research. You should also submit a "HIPAA Waiver Request" (attached). (I wasn't aware of the Waiver Request when we talked earlier this month.) Send those documents to me, and I'll pass them on to our IRB contact. I don't know whether you'll need to go through an IRB review with your institution.

In short, both your request and Dr. Hanna-Attisha's are in process in accordance with departmental policies.

I've attached a PDF that includes the numbers behind the graphs you referred to, and I'm CC'ing Dr. Hanna-Attisha so that she has it as well.

Please keep in mind that I work for a very small program responsible for processing several thousand blood lead results every week--in order to get them out to the professionals working directly with children and families, which is the primary purpose and highest priority of our program.

Bob

Robert L. Scott
Childhood Lead Poisoning Prevention Program
Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

From: Marc Edwards [mailto:edwardsm@vt.edu]
Sent: Thursday, September 24, 2015 8:14 PM
To: Scott, Robert L. (DCH) <ScottR9@michigan.gov>
Subject: RE: Automatic reply: New DCH-1294, time-sensitive

Dear Robert,

I just spoke to this young researcher at Hurley, and apparently, she has been unable to get access to the state blood lead records.

I have to say, it is very disturbing that the state keeps issuing these blood lead reports and statements in their press releases, and refuses to share the data backing them up with outside researchers.

Even worse, state reps are running around claiming that these reports are proof that Flint water is safe to drink.

Can you tell me why it is so difficult to get this data, and why your agency is raising so many obstacles to sharing it with everyone who asks? I note that I have been asking to see your data since MDEQ first sent it to reporters back in August, and I count 10 e-mails that I sent responding to all your questions. As of yet, you have given me nothing in response. Yet you have been sending reporters one report after another. It seems your agency is more interested in public relations than sound science.

In the meantime, can I at least be given the numbers of EBL cases and number of tests each month, that are the basis for the latest graph your agency is sending to the press...or is that top secret as well?

Marc

From: Scott, Robert L. (DCH) [mailto:ScottR9@michigan.gov]
Sent: Monday, September 21, 2015 1:21 PM
To: Marc Edwards
Subject: Automatic reply: New DCH-1294, time-sensitive

I'll be out of the office until Wednesday, Sept 23. I'll respond to your message when I return.

Lishinski, Karen (DHHS)

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 10:35 PM
To: Smith, Jennifer (DCH)
Cc: Emily Houk R2P (emily@r2pconsultants.com); Lishinski, Karen (DCH)
Subject: Re: childhood lead, question

Yes, I think we can create and share a first draft, and try to connect with you early next week to review it.

Sent from my iPad

On Sep 16, 2015, at 4:21 PM, Smith, Jennifer (DCH) <smithj32@michigan.gov> wrote:

Thanks Nancy. To confirm, will your team be doing a first draft? Or providing some language?

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 11:57 AM
To: Smith, Jennifer (DCH) <smithj32@michigan.gov>
Cc: Emily Houk R2P (emily@r2pconsultants.com) <emily@r2pconsultants.com>; Lishinski, Karen (DCH) <LishinskiK@michigan.gov>
Subject: RE: childhood lead, question

Our staff will use the talking points, and we can also share them with the Healthy Homes Section.

Attached is the data that we had forwarded in response to the request from the Director's office, which was passed on to the Governor's office.

From: Smith, Jennifer (DCH)
Sent: Wednesday, September 16, 2015 11:22 AM
To: Peeler, Nancy (DCH)
Cc: Emily Houk R2P (emily@r2pconsultants.com); Lishinski, Karen (DCH)
Subject: RE: childhood lead, question

Sounds good – I haven't seen any of the info that was sent to the gov's office. Can you send that my way?

Also, who do you foresee using the talking points?

I'll be out of the office for the next couple of days, so if your team could send a first draft my way that would help get the ball rolling.

Thank you!
Jennifer

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 11:15 AM
To: Smith, Jennifer (DCH) <smithj32@michigan.gov>
Cc: Emily Houk R2P (emily@r2pconsultants.com) <emily@r2pconsultants.com>; Lishinski, Karen (DCH)

<LishinskiK@michigan.gov>
Subject: RE: childhood lead, question

We are starting to get questions, so relatively soon, say within a week or so?

From: Smith, Jennifer (DCH)
Sent: Wednesday, September 16, 2015 11:13 AM
To: Peeler, Nancy (DCH)
Cc: Emily Houk R2P (emily@r2pconsultants.com); Lishinski, Karen (DCH)
Subject: RE: childhood lead, question

Thanks Nancy – sounds good! When are you looking to have these finalized?

Jennifer

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 16, 2015 11:03 AM
To: Smith, Jennifer (DCH) <smithj32@michigan.gov>
Cc: Emily Houk R2P (emily@r2pconsultants.com) <emily@r2pconsultants.com>; Lishinski, Karen (DCH) <LishinskiK@michigan.gov>
Subject: FW: childhood lead, question

Hi Jen – based on email with Angela, we'd like to set up a time to work with you to develop some talking points about our state childhood lead program, especially related to the water situation in Flint.

I am in and out of the office quite a bit the next week or so, so I wanted to ask if our communications consultant Emily Houk, and our program nurse, Karen Lishinski, can work with you to get started on this? We appreciate the help! I have copied Emily and Karen on this email so you can reach out to them, or vice versa.

Nancy

From: Minicuci, Angela (DCH)
Sent: Friday, September 11, 2015 4:16 PM
To: Peeler, Nancy (DCH)
Subject: RE: childhood lead, question

I'd recommend touching base with Jen Smith. She can help draft talking points!

Angela

From: Peeler, Nancy (DCH)
Sent: Friday, September 11, 2015 4:11 PM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Subject: RE: childhood lead, question

Thanks, Angela – I will reach out to him on Monday.

After I contacted you, had a call from CDC. They are hearing about the issues/questions regarding Flint, and were suggesting that we take time to develop a response to any questions we are getting, that is carefully considered. I think that means we need your assistance! What's the best way to connect with you or your staff for this purpose?

From: Minicuci, Angela (DCH)
Sent: Friday, September 11, 2015 4:05 PM
To: Peeler, Nancy (DCH)
Subject: RE: childhood lead, question

Hi Nancy,

I don't see an issue with this. Seems pretty straightforward to me.

Angela

From: Peeler, Nancy (DCH)
Sent: Friday, September 11, 2015 2:43 PM
To: Minicuci, Angela (DCH) <MinicuciA@michigan.gov>
Subject: childhood lead, question
Importance: High

Hi Angela – we had a call from a pediatrician in Flint, who we know because he sits on our Provider Work Group. He asked for some childhood lead data, of the type that we had sent over to the Director, that was forwarded to the Governor's office. Erring on the side of caution, I wanted to check whether you are good with us sharing that same information with him. See attached. I realize that the Gov's office shared it with the group of Pastors they were meeting with, so it may be out in the public already. Anyway – if you see this and can give an opinion, I appreciate it.

Nancy

Lishinski, Karen (DHHS)

From: Baker, Mary A. (DCH)
Sent: Thursday, September 17, 2015 11:05 AM
To: Bien, Stan (DCH); Hanulcik, Kristen (DCH)
Subject: Flint water supply

In Nancy Peeler's absence, I was able to reach a nurse consultant in the Lead program by the name of Karen Lishinski. The Lead program is working with Jennifer Smith of the Communications division to craft a department response to the issue. She had no timeline for when the response is expected. I explained our stake in this and asked her to keep us in the loop, which she agreed to do. Here are a few of the points I picked up from her during our conversation.

- This issue has been ongoing for a while now, but picked up steam in July when the Virginia Tech folks got involved
- The Lead program's division epidemiologist has analyzed results and finds that there is a seasonal uptick in elevated blood lead levels, but it is not unusual compared to previous years. They frequently see elevated levels in the summer, presumably because children are outside more and exposed to dirt which may have elevated levels of lead, windows are opened and closed so the paint is disturbed, etc.
- The EPA conducted tests in Genesee Co. and found that 70 out of 995 samples showed lead levels of 25 parts per billion (the recommended allowable level is no more than 15 parts per billion)
- There's no way to identify exactly what kind of exposure to lead caused those 70 samples to be elevated. In other words, they don't know with certainty that it was due to the water supply situation.
- The Lead program has also been in touch with a CDC public health advisor about the issue

Nancy Peeler, who I gathered is the division director, will be back in the office on Monday. In the meantime, if you have questions, Karen is very helpful.

Mary Ann Baker
WIC Policy Specialist
MDHHS/WIC Program
Consultation and Nutrition Services Unit
Phone: 517-335-0031
Fax: 517-335-8835



Lishinski, Karen (DHHS)

From: Baker, Mary A. (DCH)
Sent: Thursday, September 17, 2015 11:54 AM
To: Lishinski, Karen (DCH)
Subject: FW: Reply - Information requested about Flint, MI and lead in water issue
Attachments: Flint water supply

Importance: High

Wow, Karen – things are really moving fast now, the issue has gone up to the Secretary of the USDA! Here's an FYI for you (see below). BTW, I should've copied you on my message to Stan and Kristen after our conversation --sorry for the oversight but the message is attached.

Mary Ann Baker
WIC Policy Specialist
MDHHS/WIC Program
Consultation and Nutrition Services Unit
Phone: 517-335-0031
Fax: 517-335-8835



From: Bien, Stan (DCH)
Sent: Thursday, September 17, 2015 11:47 AM
To: Bartholomew, Anne - FNS
Cc: Hillman, Bruce - FNS; Travis, Rashmi (DCH); Hanulcik, Kristen (DCH); Baker, Mary A. (DCH)
Subject: Reply - Information requested about Flint, MI and lead in water issue
Importance: High

Hi Anne – In follow up to our phone discussion, attached is info our staff obtained this morning on the water issue.

As discussed, this is a Public Health issue, not just WIC. As of now, there has been no 'official advisory' to not use the water and our SNAP clients can purchase water with their benefits if so needed.

Per the WIC Regs, we must have special justification to issue RTF of 'If the water is unsanitary or restricted'.

We will continue to work with our Lead Program and monitor the situation. Thank you.

Stan Bleu, Director
Michigan WIC Program - BFMCH
Michigan Department of Health & Human Services
320 South Walnut Street - 6th Floor
Lansing, MI 48913
517.335.8448

From: Bartholomew, Anne - FNS [<mailto:Anne.Bartholomew@fns.usda.gov>]

Sent: Thursday, September 17, 2015 11:22 AM

To: Bien, Stan (DCH)

Cc: Hillman, Bruce - FNS

Subject: Information requested about Flint, MI and lead in water issue

Hi Stan,

Bruce suggested that I contact you directly. I did leave a voice mail. We have an urgent request from the USDA Secretary on behalf of a Congressperson about a problem with high lead levels in water supply in Flint, MI. We are wondering what steps, if any, that Michigan WIC has taken with respect to this issue. Has Michigan WIC determined a need to issue ready-to-feed for affected participants? If yes, is this being done on an individual basis or universally to those living in the affected area. The Secretary has requested a quick response so your attention to this request is greatly appreciated.

Many thanks,

Anne

Anne Bartholomew M.S., R.D.
Supplemental Food Programs Division
Branch Chief, Nutrition Services

Lishinski, Karen (DHHS)

From: Baker, Mary A. (DCH)
Sent: Thursday, September 17, 2015 10:34 AM
To: Lishinski, Karen (DCH)
Subject: FW: Water with WIC

Hi Karen. Thank you so much for your time and the information you provided today. Here is the e-mail to which I referred. Again, please don't share this with anyone else. I will be out on Friday, but back in the office on Monday. However, if something urgent arises on Friday, please contact my supervisor, Kristen Hanulcik at hanulcikk@michigan.gov or our division director, Stan Bien at biens@michigan.gov.

Thanks,

Mary Ann Baker
WIC Policy Specialist
MDHHS/WIC Program
Consultation and Nutrition Services Unit
Phone: 517-335-0031
Fax: 517-335-8835



From: Hanulcik, Kristen (DCH)
Sent: Wednesday, September 16, 2015 8:07 PM
To: Bien, Stan (DCH)
Cc: Baker, Mary A. (DCH)
Subject: Re: Water with WIC

I would agree with that from an access perspective, for instances when an alternative to tapwater is desirable.

I would like to talk with you and Mary Ann about this more in the morning if we can make that happen.

Meanwhile, I have Mary Ann copied as a think we should be in touch with our state lead contact regarding this.

If area hospitals are going to be providing discharge instructions to mix formula with bottled water, this will have big implications for the WIC agency.

Sent from my iPhone

On Sep 16, 2015, at 4:24 PM, Bien, Stan (DCH) <biens@michigan.gov> wrote:

Kristen – Please review and my suggestion is to obtain water via SNAP benefits, as WIC can not provide the bottled water. Comments? Thanks

*Stan Bica, Director
Michigan WIC Program ~ BFMCH
Michigan Department of Health & Human Services
320 South Walnut Street - 6th Floor
Lansing, MI 48913
517.335.8448*

From: Valacak, Mark [mailto:MVALACAK@gchd.us]
Sent: Wednesday, September 16, 2015 4:19 PM
To: Bien, Stan (DCH)
Cc: Brickey, Tamara; Scharer, Dawn; LaRocco, Toni
Subject: FW: Water with WIC

Stan,

This is the request we received from Dr. Hanna- Attisha at Hurley regarding infant formula that I left you a message about on your voicemail.

I am also including a link to the M-live article about the controversy.

http://www.mlive.com/news/flint/index.ssf/2015/09/virginia_tech_researcher_says.html

Mark Valacak, MPH, Health Officer
Genesee County Health Department,
630 S. Saginaw St. Suite 4 Flint, MI 48502-1540
Phone 810-257-3588 Fax 810 257-3147
E-mail mvalacak@gchd.us
<image002.jpg>

Please consider the environment before printing this e-mail.

"There are two lasting bequests we can hope to give our children: one is roots; the other is wings." Hodding Carter
*NOTICE: This e-mail, including attachments, is intended for the exclusive use of the addressee and may contain proprietary, confidential or privileged information. If you are not the intended recipient, any disclosure, use, distribution, copying, or taking of any action in reliance of the contents of this e-mail is strictly prohibited. If you have received this e-mail in error, please notify me via e-mail and permanently delete the original and destroy all copies. Thank you.

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From: Mona Hanna-Attisha [mailto:MHanna1@hurleymc.com]
Sent: Wednesday, September 16, 2015 1:40 PM
To: Valacak, Mark; Johnson, M.D., Gary; LaRocco, Toni; Brickey, Tamara
Cc: Lawrence Reynolds; 'Dean Sienko'
Subject: Water with WIC

All,

I briefly spoke with Toni yesterday about this, but would it be possible to give bottled water or nursery water (vouchers or actual bottles) to our families with formula fed babies through WIC. The babies who

are drinking formula mixed with tap water (especially warm tap water) are at greatest risk for lead exposure. Water is such a huge proportion of their diet and their brains are still developing.

Until we have definitive information about lead exposure, we should err on additional prevention, especially for our most vulnerable kids.

Let me know what you think or if there is someone else I should contact about this. Thanks! Mona

Mona Hanna-Attisha MD MPH FAAP
Program Director Pediatric Residency
Hurley Children's Hospital at Hurley Medical Center
Michigan State University College of Human Medicine
Department of Pediatrics and Human Development
Mhanna1@hurleymc.com

<image001.jpg>

Lishinski, Karen (DHHS)

From: Peeler, Nancy (DCH)
Sent: Monday, September 21, 2015 2:19 PM
To: Lishinski, Karen (DCH)
Cc: Fink, Brenda (DCH)
Subject: Re: Angela

Were you able to encourage her to speak directly with Healthy Homes to get an answer about what their program does? I understand her frustration, just want to support her as much as possible.

Sent from my iPad

On Sep 21, 2015, at 2:02 PM, Lishinski, Karen (DCH) <LishinskiK@michigan.gov> wrote:

Hi Nancy and Brenda,

Just to let you know that Angela Minicucci called and wanted to know if our program did any water testing. Of course I told her "no" and explained that all of the blood lead levels of anyone tested in Michigan come to our office.

She was told by DEQ that we did water testing. I said that HHS may do some on occasion but I do not believe it is part of a standard Lead Investigation/Risk assessment or EBL investigation. She seemed a little frustrated, getting conflicting information.

Karen

Lishinski, Karen (DHHS)

From: Groetsch, Kory J. (DCH)
Sent: Thursday, September 24, 2015 1:19 PM
To: Benzie, Richard (DEQ); Bruneau, Michelle (DCH); Busch, Stephen (DEQ); Dawn Hallwood (dhallwood@gchd.us); Dykema, Linda D. (DCH); Henry, James; Houk, Emily (DCH); Lishinski, Karen (DCH); Peeler, Nancy (DCH); Shekter Smith, Liane (DEQ); Valacak, Mark; Wurfel, Brad (DEQ)
Cc: Groetsch, Kory J. (DCH)
Subject: Flint Pb Health Education Conference Call Summary

Hello All,

Below is a summary from our call. Please note the action items. In addition, Karen Lishinski pointed out this EPA website as a good resource: <http://water.epa.gov/drink/contaminants/basicinformation/lead.cfm>

SUMMARY:

A conference call with the attendees listed below occurred on 9/22/2015 discussing lead (Pb) outreach in the city of Flint. The purpose of the call was to facilitate introductions, and identify Pb health education materials, current Pb outreach efforts in Flint and existing resources. DEQ provided a brief background of the drinking water compliance process in relation to efforts being conducted in Flint. Information sharing occurred between attendees about the Pb in drinking water sampling efforts in Flint.

Each agency/department listed their current health education efforts and available resources that could be made available relative to Pb outreach in Flint. The CLPPP provides some limited funding to prosperity region 6 to conduct Pb outreach. CLPPP is building a Pb Tool Kit for providers. Information about Pb in drinking water does not currently exist in these materials, but they are interested to build that information into the tool kit. DEQ has contacts with the Flint's drinking water program. GCHD has been getting many phone calls and they have had to create factsheets about water hardness and trihalomethanes.

Action Items from the Call:

1. Participants will e-mail their Pb outreach materials and presentations that are in current use to Michelle Bruneau (BruneauM@michigan.gov).
2. GCHD will send Michelle a list of concerns they have been getting from the Flint community.
3. Michelle will look over the materials to assess what messages are covered, what messages are not covered, and provide suggestions on what work may need to be done to address gaps.
4. Follow-up is needed on the water sampling directions being provided by the city to homeowners that request a Pb in tap water analysis. (There are two sampling procedures depending on the purpose of the water sample.)
5. Karen Lishinski will provide a contact at WIC, so they can be invited to our follow-up conference call.
6. MDHHS-DEH will arrange a follow-up conference call in approximately two weeks.

Attendees:

Dawn Hallwood (Genesee Co HD)
James Henry (GCHD)
Mark Valacak (GCHD)
Brad Wurfel (DEQ)
Liane Shekter-Smith (DEQ)
Richard Benzie (DEQ)
Stephen Busch (DEQ)

Nancy Peeler (DHHS)
Karen Lishinski (DHHS)
Linda Dykema (DHHS)
Kory Groetsch (DHHS)
Michelle Bruneau (DHHS)

Current plan is to schedule another conference call in two weeks. Clearly, this is a dynamic and evolving situation.

FYI- I am currently in St. Ignace participating in an emergency response exercise.

Best Regards,

Kory Groetsch, MS , Manager
Toxicology and Response Section
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Lishinski, Karen (DHHS)

From: Lishinski, Karen (DHHS)
Sent: Thursday, October 01, 2015 8:12 AM
To: Peeler, Nancy (DCH)
Subject: FW: Hurley -- follow up about the question on Hurley lab results

Nancy,

I just wanted to add that the Spice Collaborative was founded when I noticed a trend of groups of siblings with high lead levels in areas that normally have fewer EBLs. At this time I was only seeing the 20+. Now I see all children with ebls.

From: Scott, Robert L. (DHHS)
Sent: Thursday, October 01, 2015 8:06 AM
To: Peeler, Nancy (DCH)
Cc: Lishinski, Karen (DHHS)
Subject: RE: Hurley -- follow up about the question on Hurley lab results

We report on testing and elevated levels annually by fiscal year for the legislature--by county/Detroit and the state. We report annually by calendar year for stakeholders and the public--by county, by several funded communities, and by ZIP code; also the Medicaid population by county. These annual reports include tables, graphs and maps to provide detailed information about the past year, as well as trends over several years. We produce other reports by request.

We used to produce similar reports by quarter, and even a special monthly report for funded health departments. But as we have lost funding and staff, and as my own time has been pulled in other directions, these other more-frequent reports have fallen away.

Child- and address-specific data continues to be provided to every local health department every week—via HHPSS on-line system, and via securely-transmitted Excel files--so that they have information on lead levels for children in their jurisdictions.

BLLs >= 20 are faxed to local health departments the same day we receive them. Starting a few months ago, copies of all BLLs >= 5 are provided to our Nurse Consultant weekly, to help her monitor elevated levels in each local jurisdiction.

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 30, 2015 6:50 PM
To: Wells, Eden (DHHS) <WellsE3@michigan.gov>; Miller, Corinne (DHHS) <MillerC39@michigan.gov>; Miller, Mark (DHHS) <millerm1@michigan.gov>; LyonCallo, Sarah (DHHS) <lyoncallos@michigan.gov>; Dykema, Linda D. (DHHS) <DykemaL@michigan.gov>; Priem, Wesley F. (DHHS) <priemw@michigan.gov>; Travis, Rashmi (DHHS) <TravisR@michigan.gov>
Cc: Fink, Brenda (DHHS) <FinkB@michigan.gov>; Scott, Robert L. (DHHS) <ScottR9@michigan.gov>
Subject: RE: Hurley -- follow up about the question on Hurley lab results

I can partially answer your question now, will get additional info from Bob and send more later.

The data flows in daily, year-round. We process several thousand test results every week. We monitor the results daily, and have an algorithm for our follow-up response, based on the blood lead level.

Because we are processing results every day, we do see some patterns if they begin to emerge, especially with the higher lead levels. We normally track and report data at health department level, county level/Detroit. We are still building our capacity and putting new procedures in place via our CDC Surveillance grant to crank out more

reports/report cards, and more frequent data reports, especially with the switch in focus to levels of 5 and above (which means we are focusing on a larger number of results than just 10 and above). We develop and share out many maps, charts, graphs, and yes, do publish an annual legislative report.

We have .2 FTE Epi support (Cristin Larder), mostly for special projects and/or reports, for example, Cristin is working with us and Dr. Stan Kaplowitz from MSU to use his research to help pinpoint smaller geographic areas with higher risk, so we can better direct resources toward those areas.

Bob, can you please add more information about frequency of your analysis, and how we detect issues?

From: Wells, Eden (DCH)
Sent: Wednesday, September 30, 2015 6:24 PM
To: Peeler, Nancy (DCH); Miller, Corinne (DCH); Miller, Mark (DCH); LyonCallo, Sarah (DCH); Dykema, Linda D. (DCH); Priem, Wesley F. (DCH); Travis, Rashmi (DCH)
Subject: RE: Hurley -- follow up about the question on Hurley lab results

That sounds about right.

May I ask,, is it CLPP's usual process to collect the lead data on an ongoing basis...if so, at what level is the data usually analyzed (by Epi?) IS it daily,nmonthly? Quarterly? Annually? How would we normally detect/know if there is an issue in a particular locality---do you look at it at county level or smaller when you peruse your data? This question may arise...

E

From: Peeler, Nancy (DCH)
Sent: Wednesday, September 30, 2015 5:22 PM
To: Miller, Corinne (DCH); Miller, Mark (DCH); LyonCallo, Sarah (DCH); Dykema, Linda D. (DCH); Priem, Wesley F. (DCH); Travis, Rashmi (DCH); Wells, Eden (DCH)
Subject: FW: Hurley -- follow up about the question on Hurley lab results

Hi all – I talked to Bob to confirm the information I had shared about the Hurley lab results. It is a little more nuanced than I had explained, forwarding Bob's explanation, FYI.

From: Scott, Robert L. (DCH)
Sent: Wednesday, September 30, 2015 5:05 PM
To: Peeler, Nancy (DCH)
Subject: Hurley

Hurley Medical Center is listed as the "Provider" on approximately half of the blood lead results we received for Flint children in 2014—I assume that pattern holds in 2015 and in recent years. Warde Medical Lab is listed as the "Laboratory" on those results. Warde reported the results to CLPPP in accordance with State law.

I can't say whether the blood specimens were a) drawn at Hurley's lab, or b) simply passed through Hurley's lab—from physician office to Hurley to Warde for analysis. As I understand it, both scenarios are common at various hospital labs.

Robert L. Scott
Childhood Lead Poisoning Prevention Program

Michigan Department of Health & Human Services
(517) 335-8178
fax (517) 335-8509

Lishinski, Karen (DHHS)

From: Lishinski, Karen (DHHS)
Sent: Thursday, October 01, 2015 11:19 AM
To: Peeler, Nancy (DCH)
Subject: V45 in Flint

The only child in Flint with a V45 since 2010- was a gunshot victim in 2009.

Lishinski, Karen (DHHS)

From: Lishinski, Karen (DHHS)
Sent: Thursday, October 01, 2015 11:41 AM
To: Peeler, Nancy (DHHS)
Subject: RE: more follow up from morning meeting

Yes- to some extent I log most of my calls.

From Flint since the beginning of the year-

Feb- 2 calls from [REDACTED]-about her son's lead level ([REDACTED]!)

March- 1 call from [REDACTED]

May-1 call from [REDACTED]

August- dad from Flint re: his 16 year old son who was lead poisoned as a toddler in Detroit

September- Dr. Mona Attisha & Dr Reynolds requesting data- And then an occasional call from [REDACTED] - I have had virtually no calls from the public about the water situation!

-----Original Message-----

From: Peeler, Nancy (DHHS)
Sent: Thursday, October 01, 2015 11:26 AM
To: Lishinski, Karen (DHHS); Scott, Robert L. (DHHS)
Subject: more follow up from morning meeting

For Karen - Are you still logging the lead calls you receive? It was requested this morning that we log the calls from Flint (to understand how many we are getting), and what the questions are. And, can you give me a summary, best you can remember, about calls you've had so far? So:

--number of calls

--topics of the calls/questions received

For both, the timeline on the press release is shifting as additional analyses are conducted. All information is embargoed at this point.

Bob, just saw the email about the IRB, thanks for the update!

Sent from my iPad

Report 8: Epi-Curve Graph

Time Period: 07/01/2003 - 07/01/2013

Time Breakdown: by Month

Reportable Condition: Legionellosis

Case Status: Confirmed, Confirmed-Non Resident, Not

a Case, Probable, Suspect, Unknown

Investigation Status: Active, Canceled, Completed,

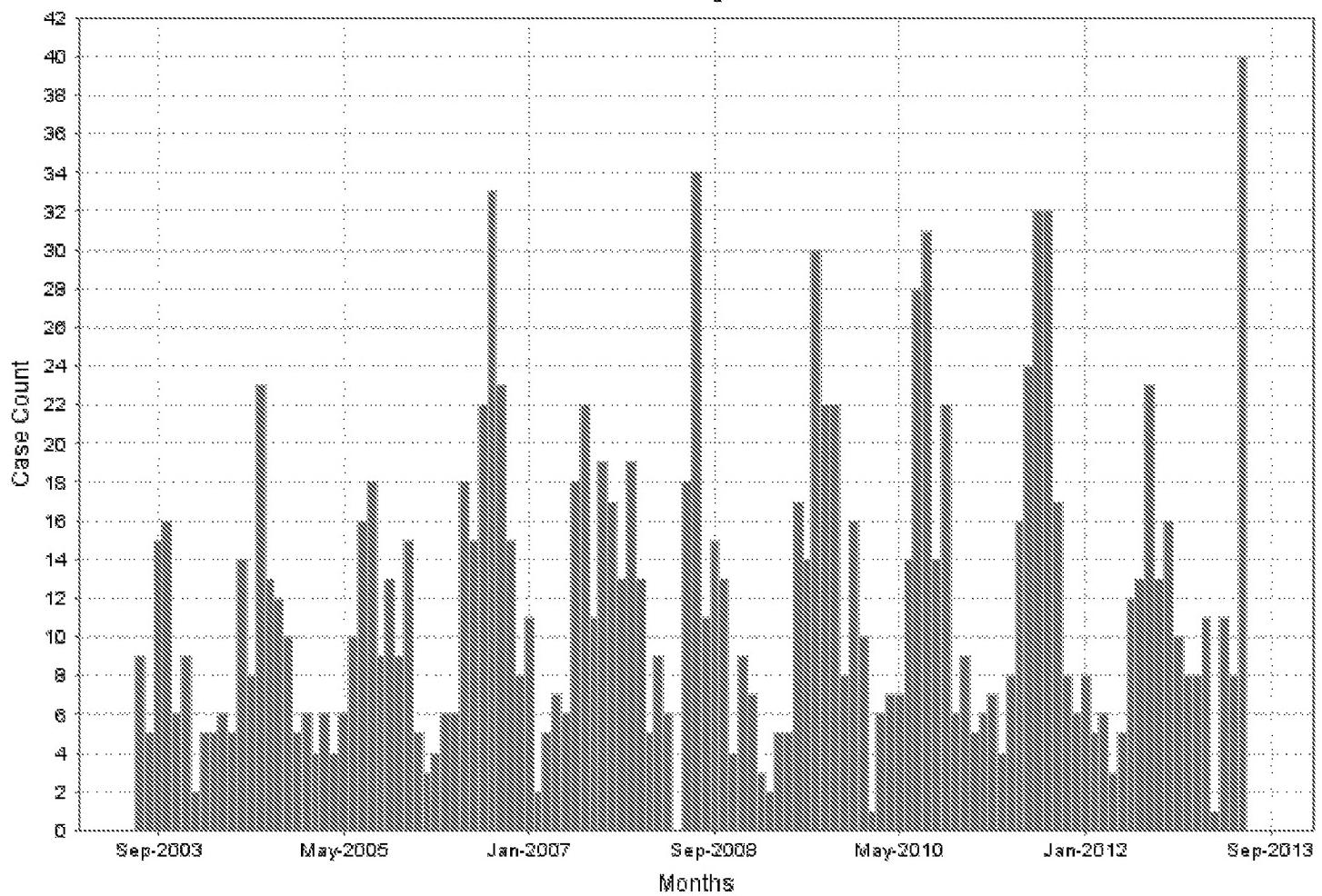
Completed - Follow Up, New, Review, Superceded

Regions:

2 North, 2 South

Case Types: Individual and Aggregate

Case Counts by Month



Month	Total								
JUL 2003	9	MAR 2005	6	NOV 2006	15	AUG 2008	11	APR 2010	7
AUG 2003	5	APR 2005	4	DEC 2006	8	SEP 2008	15	MAY 2010	7
SEP 2003	15	MAY 2005	6	JAN 2007	11	OCT 2008	13	JUN 2010	14
OCT 2003	16	JUN 2005	10	FEB 2007	2	NOV 2008	4	JUL 2010	28
NOV 2003	6	JUL 2005	16	MAR 2007	5	DEC 2008	9	AUG 2010	31
DEC 2003	9	AUG 2005	18	APR 2007	7	JAN 2009	7	SEP 2010	14
JAN 2004	2	SEP 2005	9	MAY 2007	6	FEB 2009	3	OCT 2010	22
FEB 2004	5	OCT 2005	13	JUN 2007	18	MAR 2009	2	NOV 2010	6
MAR 2004	5	NOV 2005	9	JUL 2007	22	APR 2009	5	DEC 2010	9
APR 2004	6	DEC 2005	15	AUG 2007	11	MAY 2009	5	JAN 2011	5
MAY 2004	5	JAN 2006	5	SEP 2007	19	JUN 2009	17	FEB 2011	6
JUN 2004	14	FEB 2006	3	OCT 2007	17	JUL 2009	14	MAR 2011	7
JUL 2004	8	MAR 2006	4	NOV 2007	13	AUG 2009	30	APR 2011	4
AUG 2004	23	APR 2006	6	DEC 2007	19	SEP 2009	22	MAY 2011	8
SEP 2004	13	MAY 2006	6	JAN 2008	13	OCT 2009	22	JUN 2011	16
OCT 2004	12	JUN 2006	18	FEB 2008	5	NOV 2009	8	JUL 2011	24
NOV 2004	10	JUL 2006	15	MAR 2008	9	DEC 2009	16	AUG 2011	32
DEC 2004	5	AUG 2006	22	APR 2008	6	JAN 2010	10	SEP 2011	32
JAN 2005	6	SEP 2006	33	JUN 2008	18	FEB 2010	1	OCT 2011	17
FEB 2005	4	OCT 2006	23	JUL 2008	34	MAR 2010	6	NOV 2011	8

Month	Total
DEC 2011	6
JAN 2012	8
FEB 2012	5
MAR 2012	6
APR 2012	3
MAY 2012	5
JUN 2012	12
JUL 2012	13
AUG 2012	23
SEP 2012	13
OCT 2012	16
NOV 2012	10
DEC 2012	8
JAN 2013	8
FEB 2013	11
MAR 2013	1
APR 2013	11
MAY 2013	8
JUN 2013	40

Report 8: Epi-Curve Graph

Time Period: 07/01/2012 - 07/01/2013

Time Breakdown: by Week

Reportable Condition: Legionellosis

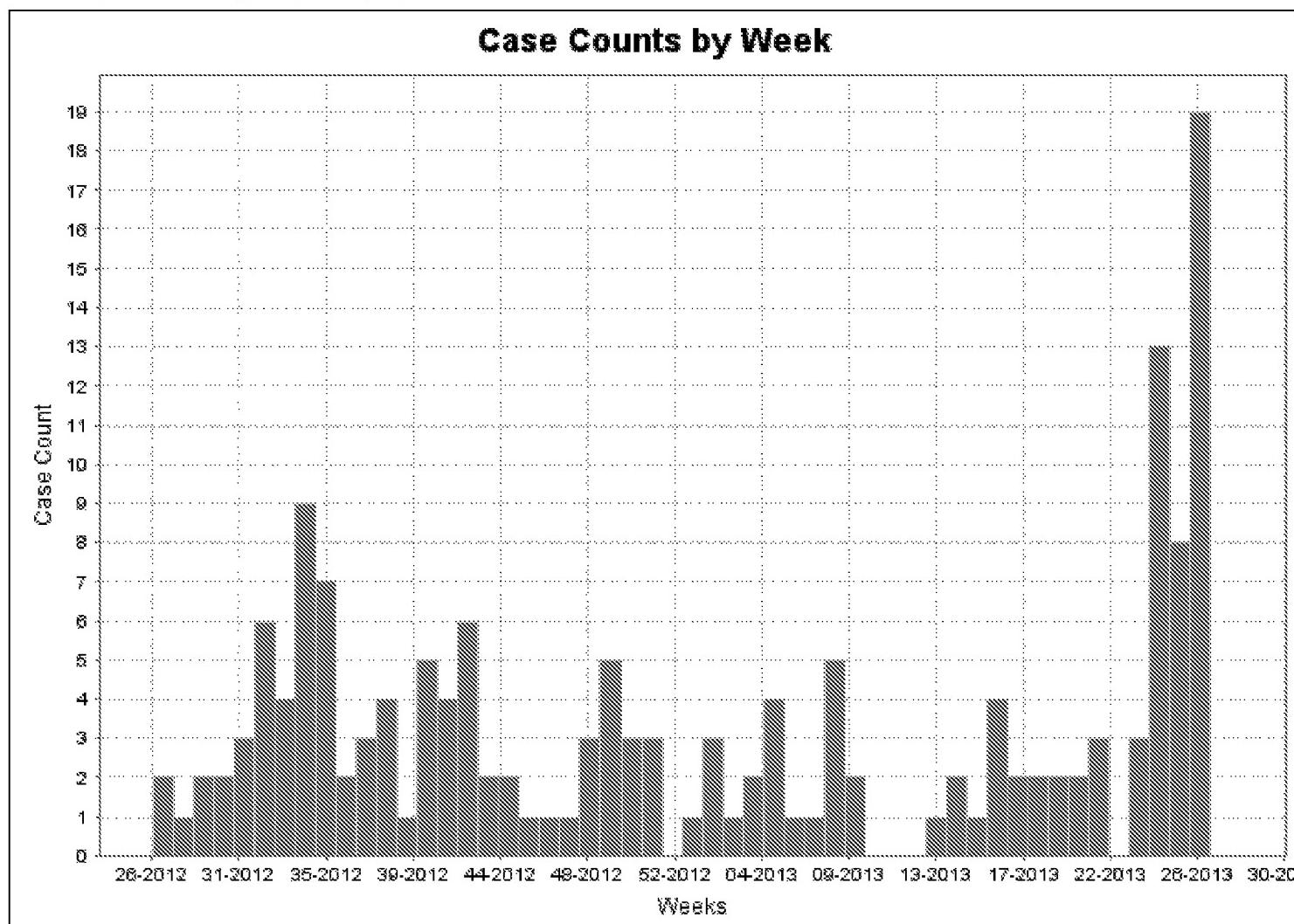
Case Status: Confirmed, Confirmed-Non Resident, Not a Case, Probable, Suspect, Unknown

Investigation Status: Active, Canceled, Completed, Completed - Follow Up, New, Review, Superceded

Regions:

2 North, 2 South

Case Types: Individual and Aggregate



Week	Total	Week	Total	Week	Total
27-2012	2	47-2012	1	19-2013	2
28-2012	1	48-2012	3	20-2013	2
29-2012	2	49-2012	5	21-2013	3
30-2012	2	50-2012	3	23-2013	3
31-2012	3	51-2012	3	24-2013	13
32-2012	6	1-2013	1	25-2013	8
33-2012	4	2-2013	3	26-2013	19
34-2012	9	3-2013	1		
35-2012	7	4-2013	2		
36-2012	2	5-2013	4		
37-2012	3	6-2013	1		
38-2012	4	7-2013	1		
39-2012	1	8-2013	5		
40-2012	5	9-2013	2		
41-2012	4	13-2013	1		
42-2012	6	14-2013	2		
43-2012	2	15-2013	1		
44-2012	2	16-2013	4		
45-2012	1	17-2013	2		
46-2012	1	18-2013	2		

